



**UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT**

October 2002

**Data Assimilation
Meteorological Office
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1 and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of $>60 \text{ m s}^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference $> 60 \text{ m s}^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure Parameter

4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbiting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbiting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPS, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from UKMO global model.
Observation times	:00, 06, 12, 18 UTC

Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees). :Sea surface temperature (Degrees).
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Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:PGE	:Percentage of observations with gross errors.
:%REJ	:Percentage of observations flagged excluding those with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. a positive bias indicates the wind observation is veered to the background.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa (pressure) :25 m s^{-1} (vector wind) :10 degrees (sea surface temperature)
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SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:
	1. bias	≥ 4 hPa (pressure), $\geq 5 \text{ m s}^{-1}$ (wind speed), ≥ 30 degrees (direction). ≥ 3 degrees (sea surface temperature).
	2.SD	≥ 6 hPa (pressure), ≥ 80 degrees (direction). ≥ 5 degrees (sea surface temperature).
	3.PGE	≥ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
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MEAN SEA LEVEL PRESSURE

BBXX KS0	P	509	18	100	4.0	4.7	6.2
CG2522	P	404	26	46	3.6	-3.5	5.0
CG2992	P	429	56	100	3.8	-8.7	9.4
C6KD6	P	57	0	0	0.9	4.7	4.8
DEOF	P	23	61	100	4.8	-8.9	10.1
D5XH	P	34	3	50	2.1	-4.4	4.9
ELZF9	P	62	0	71	1.2	4.0	4.2
KMJL	P	46	2	2	1.1	-4.9	5.1
KS000	P	83	0	2	0.9	9.2	9.2
KS002	P	52	0	92	0.4	4.5	4.5
KS004	P	178	100	100			
KS025	P	171	0	54	0.7	8.5	8.5
LADQ4	P	27	0	22	2.7	-4.6	5.4
SGIX	P	51	2	8	1.0	-4.4	4.5
UCJB	P	34	0	0	1.1	-4.2	4.3
UFAA	P	87	0	0	0.9	8.9	8.9
UFNO	P	21	0	5	3.0	7.3	7.9
UHLE	P	39	3	79	1.9	-5.3	5.6
UIAG	P	65	3	83	4.4	-4.7	6.5
VCLX	P	23	65	100	3.6	-5.6	6.6
VCRT	P	22	0	68	1.6	-5.0	5.2
V7CY9	P	79	3	20	3.7	-6.9	7.8
0210	P	57	0	46	1.4	-5.5	5.6
3FAP5	P	27	0	63	6.3	-0.9	6.4
3FOC5	P	43	0	95	0.9	5.6	5.7
31057	P	1222	0	76	3.2	4.7	5.7
48092	P	189	100	100			
62114	P	25	0	96	1.1	5.9	6.0
63108	P	122	1	100	2.0	10.6	10.8
9HER7	P	20	0	100	0.8	8.7	8.8
9HHC7	P	28	0	64	1.4	4.3	4.5
9VVS	P	32	0	0	1.4	4.3	4.5

WIND SPEED

BBXX KS0	SPEED	248	0	100	2.4	-5.2	5.7
ELYB2	SPEED	22	0	100	3.4	5.2	6.2
KS004	SPEED	100	0	2	2.9	-5.1	5.8
KS025	SPEED	111	0	35	1.9	-6.3	6.6
P3EK7	SPEED	36	0	47	4.2	5.0	6.5
SGAK	SPEED	24	0	33	4.0	5.8	7.0
SGIX	SPEED	50	0	4	4.4	5.1	6.7
3FZM	SPEED	52	0	75	3.0	-6.2	6.9
9WCY2	SPEED	37	0	43	5.0	8.6	9.9

WIND DIRECTION

FHZI	DIRN.	57	14	0	41.4	-95.5	104.1
GHKF	DIRN.	57	0	0	13.5	30.5	33.3
VCLM	DIRN.	140	1	0	125.5	-24.8	127.9

SEA SURFACE TEMPERATURE

CGDS	SST	21	57	62	2.7	1.2	2.9
CGDX	SST	213	76	100	0.8	0.3	0.9
CGHL	SST	43	28	63	0.5	0.0	0.5
CG2350	SST	247	42	100	1.1	0.3	1.1
CG2522	SST	383	78	100	2.3	4.6	5.2
CG2992	SST	418	90	100	0.7	8.7	8.7
CG8048	SST	47	100	100			
C6FN5	SST	20	35	35	1.7	0.0	1.7
C6MS4	SST	41	0	100	1.3	-3.9	4.1
DGCP	SST	32	0	41	1.0	3.4	3.5

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
SEA SURFACE TEMPERATURE							
DHMN	SST	33	0	6	0.6	3.1	3.2
EIQN	SST	171	90	90	0.9	-0.3	0.9
FNCM	SST	104	65	100	0.4	-0.1	0.5
FNJI	SST	122	0	100	0.9	3.3	3.4
FNRS	SST	78	36	36	1.3	-0.4	1.4
GDST	SST	64	100	100			
H3QA	SST	66	0	77	0.7	-4.0	4.1
H9GW	SST	29	0	100	0.6	3.0	3.1
H9IM	SST	22	0	100	0.5	3.9	3.9
KGJX	SST	40	15	40	1.2	3.1	3.3
KRPB	SST	64	0	100	0.8	-5.1	5.2
KS011	SST	107	0	45	1.4	-3.3	3.6
KS014	SST	46	48	100	3.5	3.7	5.1
LAVW4	SST	41	2	34	2.6	-3.2	4.2
MQKG7	SST	37	0	97	0.6	-4.9	4.9
P3NB5	SST	34	9	41	2.9	3.2	4.3
P3SL7	SST	52	8	62	3.7	-4.5	5.9
P3ZY6	SST	27	4	100	1.0	-6.5	6.6
SGAK	SST	27	4	33	0.8	3.6	3.7
SHIPBL	SST	24	4	100	1.3	-4.2	4.4
UBSW	SST	28	0	54	3.5	-3.6	5.0
UCBP	SST	36	0	100	2.2	-4.7	5.2
UCDM	SST	29	3	83	2.2	-4.7	5.2
UCOZ	SST	29	0	100	2.0	-4.4	4.9
UCTA	SST	23	0	13	1.0	-3.2	3.4
UGMC	SST	33	0	33	2.1	3.1	3.8
UHRT	SST	29	0	62	0.7	-3.4	3.5
VCLM	SST	458	29	100	1.9	1.1	2.2
VGLZ	SST	26	100	100			
VJNV	SST	32	0	72	1.2	3.6	3.8
WCW9126	SST	66	97	100	0.1	0.2	0.2
WDHL	SST	28	32	100	1.3	-3.3	3.5
WGJF	SST	34	3	71	2.1	-3.2	3.8
WUW2120	SST	22	86	86	1.2	-0.9	1.5
WWU8	SST	31	100	100			
WXN3191	SST	54	4	48	1.7	-3.1	3.5
XYYY	SST	165	2	90	2.6	4.9	5.5
ZCBU5	SST	50	0	32	1.1	3.3	3.5
ZQVN8	SST	35	0	49	2.3	-4.2	4.7
3FJV4	SST	23	4	65	1.4	3.8	4.0
45140	SST	601	100	100			
45141	SST	194	4	100	3.5	4.8	6.0
45147	SST	635	100	100			
45148	SST	396	100	100			
45152	SST	531	100	100			
46131	SST	683	100	100			
46146	SST	691	100	100			
46181	SST	679	100	100			
5WDC	SST	23	0	43	2.4	3.1	3.9
52082	SST	55	64	64	0.2	0.1	0.2

Global average number of observations in 24 hours = 20703



TABLE 2

**MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002**

Monitoring procedures

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for drifting buoys.	
Standard of comparison	:Background field from UKMO global model.	
Position	:Average latitude and longitude for period.	
Observation times	:00, 06, 12, 18 UTC	
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	: Percentage of observations flagged excluding those with gross errors
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. a positive bias indicates the wind observation is veered to the background.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1} :10 degrees	(pressure) (vector wind) (sea surface temperature)
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:
	1. bias	≥ 4 hPa (pressure), ≥ 5 m s^{-1} (wind speed), ≥ 30 degrees (direction). ≥ 3 degrees (sea surface temperature).
	2. SD	≥ 6 hPa (pressure), ≥ 80 degrees (direction). ≥ 5 degrees (sea surface temperature).
	3. PGE	≥ 25 .

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
13501	44.6	33.5	P	73	100	100			
13504	44.6	33.5	P	138	100	100			
13508	44.6	33.5	P	60	100	100			
23562	7.1	86.4	P	100	100	100			
25571	86.2	164.1	P	234	37	100	8.0	-2.7	8.5
41525	44.6	33.5	P	75	100	100			
44504	50.6	-40.9	P	522	17	71	7.1	-2.3	7.5
48574	75.9	-127.7	P	713	47	100	5.3	-2.8	6.0
71543	-55.7	-28.5	P	87	14	80	3.8	6.4	7.4
WIND SPEED									
41652	29.1	-65.3	SPEED	597	10	100	5.4	5.0	7.3
WIND DIRECTION									
21535	26.5	150.9	DIRN.	340	0	0	26.5	-35.1	44.0
23594	18.3	90.8	DIRN.	68	0	0	42.9	104.4	112.9
23924	10.2	88.6	DIRN.	66	0	0	64.8	85.0	106.9
41536	20.1	-68.4	DIRN.	217	0	0	17.9	32.0	36.6
41648	24.9	-70.4	DIRN.	143	1	0	22.3	70.7	74.1
41667	27.6	-75.7	DIRN.	32	59	0	35.8	42.9	55.9
52529	22.5	143.7	DIRN.	21	86	0	27.5	-32.7	42.7
SEA SURFACE TEMPERATURE									
13501	44.6	33.5	SST	75	51	97	5.8	3.9	7.0
13504	44.6	33.5	SST	147	46	81	5.1	0.5	5.2
13508	44.6	33.5	SST	68	29	90	5.7	1.6	6.0
23510	5.8	73.0	SST	437	0	75	1.2	-3.1	3.3
23645	6.2	80.1	SST	55	75	91	4.5	-4.5	6.3
31975	-22.9	-43.1	SST	54	0	100	1.5	4.3	4.6
32526	4.9	-93.9	SST	192	100	100			
32907	8.1	-78.9	SST	169	100	100			
41525	44.6	33.5	SST	73	42	97	7.0	2.4	7.4
41563	20.6	-54.3	SST	516	0	100	0.5	7.6	7.7
44504	50.6	-40.9	SST	505	75	100	0.5	9.3	9.3
44512	48.6	-29.7	SST	109	0	100	1.2	3.1	3.3
44607	41.6	-43.9	SST	546	11	100	1.9	6.1	6.4
44772	60.6	-31.2	SST	620	0	100	1.2	7.2	7.3
46972	17.9	-132.2	SST	200	0	100	0.3	3.8	3.8
51742	4.1	-143.0	SST	216	0	92	4.3	3.0	5.3
51743	-3.7	-151.9	SST	200	32	92	0.1	-0.2	0.3
51907	-5.0	-147.2	SST	213	56	59	0.1	0.0	0.1

TABLE 3
MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1. bias	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60728	36.4N	10.7E	1	MS	56	0	0	0	0.6	-8.5	8.5
61492	16.1N	13.5W	18	MS	33	0	0	0	1.5	4.4	4.6
62790	12.1N	24.9E	674	MS	52	1	2	2	1.8	4.2	4.6
63175	9.5N	45.6E	1032	M	25	1	4	0	0.8	6.4	6.4
63330	13.5N	39.5E	2070	MS	40	40	100	0			
63333	11.1N	39.7E	1903	MS	40	1	3	0	0.7	6.2	6.2
63334	10.3N	37.7E	2515	MS	38	0	0	0	0.9	11.3	11.3
63402	7.7N	36.8E	1725	S	36	0	0	0	0.8	8.6	8.6
63450	9.0N	38.8E	2354	MS	38	0	0	0	0.5	4.9	4.9
63453	8.9N	39.9E	930	S	39	0	0	0	0.7	-5.0	5.0
63471	9.6N	41.9E	1260	MS	38	0	0	0	1.0	9.9	10.0
63478	5.9N	43.6E	295	MS	35	0	0	0	0.9	5.1	5.2
63680	0.3N	32.6E	1144	S	21	0	0	5	2.4	-5.7	6.2
63801	4.9S	29.6E	882	S8	115	0	0	0	1.0	8.1	8.2
65355	9.8N	1.1E	342	MS	78	0	0	0	0.7	-12.9	12.9
66285	11.8S	19.9E	1357	8	20	14	70	0	0.2	14.5	14.5
67308	22.1S	31.7E	452	M	35	35	100	0			
68014	19.6S	18.1E	1411	S8	39	0	0	0	0.6	-4.4	4.4
68030	18.5S	25.6E	1071	8	86	0	0	1	0.8	5.1	5.2
68038	20.5S	26.0E	903	8	87	0	0	0	0.9	4.2	4.3
68338	26.9S	24.6E	1234	S8	60	60	100	0			
68396	26.5S	31.3E	641	S8	58	0	0	3	1.6	4.5	4.8
68575	30.0S	30.0E	1175	S8	95	95	100	0			
68754	32.5S	27.5E	899	S8	87	87	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23975	60.4N	88.4E	86	7	113	112	99	0	0.0	7.4	7.4
30554	54.5N	113.6E	995	MS	121	1	1	0	4.7	5.7	7.4
30967	49.9N	115.8E	623	MS	86	0	0	0	1.4	-6.6	6.7
36982	41.9N	78.2E	3635	S7	117	3	3	2	2.2	6.1	6.5
40700	39.6N	48.1E	45	MS	29	0	0	0	1.4	-4.3	4.5
40713	37.4N	46.3E	1475	MS	23	2	9	0	3.2	12.8	13.2
40741	36.6N	61.2E	235	MS	27	2	7	0	0.7	-4.7	4.8
41254	23.1N	57.7E	1755	S8	83	83	100	0			
41396	16.0N	48.9E	700	MS	28	0	0	0	0.5	6.3	6.3
41466	13.7N	44.1E	1402	8	28	0	0	0	0.7	-5.2	5.2
41517	35.3N	75.7E	2180	8	56	0	0	20	2.2	-4.0	4.6
41696	29.0N	66.6E	2015	S8	31	0	0	0	2.1	4.1	4.6
43415	8.8N	80.5E	98	S	71	71	100	0			
44304	47.3N	110.6E	1035	MS	120	0	0	35	1.5	-5.6	5.8
44416	28.6N	81.6E	720	MS	38	2	5	0	0.8	4.4	4.5
47127	36.9N	127.0E	16	MS	122	0	0	54	5.7	-5.2	7.7
48924	21.1N	101.5E	644	M	34	0	0	0	0.7	11.2	11.2
48925	20.7N	102.0E	550	M	54	30	56	20	1.6	-13.0	13.1
48935	19.5N	103.1E	1050	8	57	1	2	2	1.0	-8.7	8.8
51495	43.2N	91.7E	874	M	111	0	0	0	1.1	7.4	7.5
52866	36.6N	101.8E	2262	S	122	0	0	0	1.1	-4.8	4.9
52955	35.6N	100.8E	3201	S	122	0	0	54	3.4	8.4	9.1
56146	31.6N	100.0E	339	S	122	56	46	0	1.0	1.3	1.6
56462	29.0N	101.5E	2994	S	122	0	0	0	1.3	8.3	8.4
57816	26.6N	106.7E	1074	MS	122	115	94	0	0.3	-14.5	14.5

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	41	0	0	0	1.3	-6.8	6.9
80315	3.0N	75.3W	439	MS	90	0	0	0	1.3	-4.2	4.4
82181	2.0S	54.1W	146	MS	91	0	0	1	1.5	6.3	6.5
82246	2.6S	54.9W	176	MS	81	0	0	0	1.6	4.0	4.3
82445	4.3S	55.6W	45	MS	92	0	0	0	0.8	4.1	4.2
82765	7.3S	47.5W	193	MS	91	0	0	1	1.5	4.1	4.4
83235	12.4S	46.4W	604	MS	92	1	1	0	0.7	6.9	6.9
83319	14.7S	52.4W	315	MS	90	0	0	0	1.2	4.7	4.9
83332	14.1S	46.4W	826	MS	91	36	40	0	1.1	14.2	14.2
83531	18.6S	46.5W	940	MS	90	0	0	0	0.7	-5.8	5.8
83630	20.6S	47.4W	1026	MS	91	1	1	0	0.8	4.1	4.2
83836	25.5S	50.6W	837	MS	90	0	0	0	0.9	-5.3	5.4
84377	3.8S	73.3W	125	MS	82	0	0	0	1.3	4.9	5.1
84401	5.2S	80.6W	49	MS	86	0	0	1	1.1	4.6	4.7
84425	5.9S	76.1W	179	MS	62	0	0	0	1.3	4.3	4.5
84455	6.5S	76.4W	281	MS	58	0	0	0	1.3	7.3	7.4
84472	7.1S	78.5W	2620	S	36	0	0	0	0.6	-5.5	5.5
84686	13.6S	72.0W	3248	S	83	1	1	0	0.9	-5.5	5.6
84688	13.7S	73.4W	3444	S	38	0	0	0	0.4	-13.2	13.2
84720	14.9S	75.0W	567	MS	38	0	0	0	0.8	4.9	5.0
84782	18.1S	70.3W	468	MS	70	0	0	0	1.3	8.4	8.5
85264	18.5S	64.1W	1998	S	58	58	100	0			
85312	19.8S	63.9W	992	S	44	0	0	0	1.3	-10.7	10.8
85406	18.3S	70.3W	55	M	122	0	0	0	1.0	4.5	4.6
85432	22.5S	68.9W	2320	S8	86	0	0	0	0.6	5.4	5.4
86065	22.7S	61.5W	220	M	77	0	0	0	1.4	4.0	4.2
87904	60.3S	72.1W	199	MS	120	40	33	43	4.8	3.8	6.1

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	MS	122	0	0	10	2.4	5.9	6.4
71049	66.0N	91.8W	150	MS	119	93	78	0	0.5	14.3	14.3
71181	47.1N	55.3W	29	MS	122	0	0	16	1.9	-4.6	5.0
71475	49.3N	124.9W	76	MS	122	0	0	54	4.2	-4.0	5.8
72327	36.1N	86.7W	182	MS	122	0	0	0	0.6	4.4	4.4
72375	34.6N	111.2W	2291	MS	121	108	89	0	0.4	14.6	14.6
72376	35.2N	111.8W	2192	M	121	0	0	2	2.2	4.1	4.7
76055	31.0N	114.9W	17	MS	26	14	54	0	0.6	-0.3	0.7
76118	30.4N	109.7W	1040	MS	28	0	0	0	0.6	-10.7	10.7
76243	28.7N	100.5W	250	MS	105	0	0	1	1.3	6.5	6.6
76543	22.0N	98.8W	104	MS	31	0	0	0	1.0	5.8	5.9
76625	20.6N	100.4W	1813	MS	40	1	3	60	3.1	-5.9	6.7
76658	19.2N	103.7W	494	MS	31	0	0	0	0.6	5.5	5.5
76683	19.3N	98.2W	2248	MS	76	1	1	0	0.6	4.1	4.1
76743	18.0N	92.9W	10	MS	77	0	0	0	0.5	6.1	6.1
76762	17.5N	99.5W	1265	MS	78	0	0	1	0.7	5.8	5.8
76903	14.9N	92.3W	118	MS	85	0	0	0	0.5	6.4	6.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	42	0	0	0	0.6	8.7	8.7
94130	14.8S	131.9E	120	MS	122	0	0	0	1.1	5.1	5.2
94322	20.2S	130.0E	340	MS	116	55	47	0	1.0	-0.2	1.0
95541	29.8S	151.1E	582	MS	92	0	0	45	0.7	-5.2	5.2
97378	10.7S	123.1E	1	MS	55	53	96	0	0.2	-14.4	14.4

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
06605	47.1N	7.1E	1599	S8	120	0	0	1	0.9	-4.2	4.3
06685	47.0N	9.1E	515	MS	120	0	0	4	1.2	6.6	6.7
13269	44.3N	19.9E	176	MS	94	0	0	0	0.8	7.6	7.6
14554	44.9N	18.4E	140	S	59	6	10	0	0.7	-13.6	13.6
16450	37.6N	14.3E	940	S8	26	0	0	96	0.9	-4.9	5.0
17203	38.9N	40.5E	1177	S8	121	0	0	0	0.7	4.6	4.7
17210	37.9N	41.9E	890	MS	121	0	0	61	0.9	4.1	4.2

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	115	1	1	2	2.0	-7.8	8.1
89208	90.0S	0.0W	2835	S	69	41	59	0	0.6	-0.9	1.1
89253	63.2S	55.4W	75	M	244	2	1	0	3.0	4.4	5.3
89263	66.0S	66.1W	20	M	239	60	25	11	4.6	6.9	8.3
89264	71.4S	68.9W	780	S	205	0	0	0	1.5	7.4	7.6
89266	72.2S	60.3W	91	S	249	222	89	0	3.6	-13.5	14.0
89272	74.8S	71.5W	1369	S	242	242	100	0			
89512	70.8S	11.8E	140	MS	122	0	0	0	1.4	-4.5	4.7
89637	69.9S	130.0E	2560	S	215	103	48	0	1.5	11.5	11.6
89744	74.0S	43.0E	3353	S	259	0	0	0	0.8	8.0	8.0
89769	78.5S	168.4E	50	S	277	277	100	0			

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period	:One calendar month.
Data monitored	:Statistics for each airline carrier.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from UKMO global model.
Observation times	:All hours combined.
Level(s) monitored	:300.0 - 150.0 hPa
Elements monitored	:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	
:N REP.	:Number of observations received excluding duplicates.
:PG	:Percentage of observations with gross errors.
:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC	:Percentage of observations with calm winds.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind
SELECTION CRITERIA	:N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
AAH	2709	0	39	1.3	0.3	2683	0	39	0	6.0	0.2	
AAL	6738	1	34	1.4	0.1	6491	0	35	0	6.1	0.1	
AAR	1546	1	7	1.7	-0.5	1527	0	7	0	8.6	0.1	
ABD	26	0	8	1.6	0.4	25	0	8	0	9.6	-1.2	
ACA	3388	0	9	1.6	-0.2	3052	0	10	0	7.1	0.1	
ACI	71	0	79	1.0	0.0	71	0	79	0	10.8	1.4	
AEA	1067	0	3	1.5	0.5	530	0	3	0	7.6	0.5	
AEL	461	0	13	2.7	0.2	346	0	8	0	7.1	0.3	
AFL	511	1	2	1.7	0.4	456	0	2	0	6.4	0.6	
AFR	1774	0	7	1.6	0.3	1309	0	8	0	7.3	0.6	
AIS	210	0	9	1.9	-1.1	195	0	10	0	8.8	-0.4	
AJM	452	0	5	1.5	-0.2	350	0	5	0	8.1	0.7	
AJX	231	0	8	1.4	0.9	230	0	10	0	7.5	0.7	
AMM	152	1	10	1.8	0.3	120	0	9	0	5.9	-0.5	
AMT	1203	0	43	1.1	0.2	1207	0	43	0	5.5	-0.3	
AMX	348	1	7	2.0	0.3	231	0	5	0	8.4	0.5	
ANA	360	0	6	1.8	0.9	354	0	8	0	8.6	0.1	
ANZ	4873	0	34	1.4	0.1	4842	0	34	0	7.1	0.6	
ARG	38	13	26	3.0	1.6	22	0	27	0	15.0	3.6	
ATN	23	4	48	1.3	1.1	23	0	43	0	4.9	-1.4	
AUA	30	0	0	1.3	0.4	26	0	0	0	3.9	1.3	
AVA	316	0	4	1.9	1.0	171	0	6	0	8.6	0.8	
AVN	143	1	49	0.9	0.2	143	1	50	0	5.5	-0.7	
AXF	34	0	35	1.1	0.4	32	0	34	0	7.8	3.2	
AZA	666	4	19	3.2	1.4	532	1	8	0	8.4	0.3	
BAL	223	0	9	1.5	0.1	180	0	9	0	8.6	0.3	
BAW	831	0	9	1.7	-0.3	753	0	10	0	7.4	0.4	
BBR	162	1	2	1.4	0.9	94	0	3	0	9.6	1.6	
BSK	28	11	14	1.3	0.4	28	0	11	0	7.0	1.3	
BWA	348	0	5	1.8	0.4	225	0	4	0	6.3	0.1	
CAL	75	0	5	1.8	0.4	78	0	4	0	6.8	0.3	
CCA	277	1	13	2.4	0.6	316	1	65	0	12.2	0.3	
CES	346	1	7	1.9	0.4	352	1	7	0	8.2	0.5	
CFC	32	0	6	1.7	0.5	27	0	7	0	5.7	1.1	
CFG	818	0	5	1.6	-0.6	675	0	6	0	7.1	0.4	
CGA	31	0	0	1.1	-0.3	27	0	0	0	4.6	1.3	
CGF	21	0	0	1.1	-0.4	21	0	0	0	3.7	0.0	
CGH	71	0	0	1.0	-0.1	68	0	0	0	3.6	0.8	
CKS	315	0	100	2.7	2.3	314	0	43	0	6.3	0.6	
CLX	406	0	5	1.7	-0.4	307	0	6	0	6.4	-0.2	
CMI	134	1	16	1.6	-0.1	132	0	16	0	7.3	0.8	
COA	1054	0	43	1.6	-0.4	986	0	44	0	5.8	-0.2	
CPA	47	0	9	1.3	0.5	47	0	11	0	10.6	-1.8	
CRL	360	2	8	1.8	0.3	259	0	9	0	10.4	0.7	
CSN	169	1	11	2.1	-0.3	172	0	9	0	7.4	0.5	
CUB	329	7	20	3.3	1.9	231	0	9	0	9.2	-0.4	
DAB	126	0	3	1.1	-0.2	113	0	4	0	3.9	0.6	
DAI	92	0	0	1.0	0.1	87	0	0	0	4.0	0.8	
DAL	3297	0	40	1.3	-0.3	3105	0	41	0	6.2	-0.1	
DBR	47	2	6	1.7	-0.3	45	0	2	0	8.9	0.7	
DCE	152	0	5	1.1	0.3	124	0	6	0	7.7	0.8	
DHL	40	0	100	6.7	-6.6	38	3	29	0	11.9	2.8	
DLH	1676	0	11	1.5	0.0	1487	0	12	0	6.5	0.7	
EDW	104	1	5	1.2	0.0	84	0	5	0	4.9	0.5	
EFF	24	0	63	1.9	1.6	22	0	64	0	9.9	-1.0	
EIA	340	8	29	3.1	1.3	339	0	100	0	14.1	3.0	
ELY	166	1	4	1.7	0.0	156	0	3	0	7.2	1.3	
ETH	25	0	12	1.2	0.3	23	0	22	0	9.5	-1.2	
EVA	119	1	6	1.4	-0.1	124	2	10	0	8.6	0.3	

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				BIAS
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	
EWV	73	0	11	1.8	0.1	69	0	16	0	14.3	-0.3
FDX	2135	0	44	1.5	0.3	2119	0	44	0	7.0	0.4
FGS	112	0	2	1.4	0.5	105	0	1	0	4.5	1.6
FGZ	39	0	3	1.4	0.0	37	0	0	0	4.2	0.2
FIN	212	0	5	1.6	0.1	203	0	4	0	6.6	0.9
FJI	1249	1	65	1.2	0.4	1223	0	66	0	7.3	0.3
FOM	479	0	26	1.6	-0.1	478	0	26	0	7.4	0.9
FWQ	36	0	53	1.0	0.4	38	0	53	0	4.4	0.7
GAF	28	0	7	2.6	-1.5	28	0	0	0	5.7	-0.4
GCO	475	1	14	1.6	-0.1	477	0	53	0	8.7	0.8
GHA	111	2	3	1.4	-0.3	79	0	8	0	10.4	2.4
GOJ	23	0	0	0.9	0.3	21	0	0	0	3.2	0.5
GRL	41	0	0	1.2	0.2	39	0	0	0	4.7	1.2
GTI	346	0	10	2.1	0.2	360	1	9	0	7.6	0.2
GVR	40	0	0	0.9	-0.2	35	0	0	0	4.6	1.4
GWV	49	0	2	1.1	-0.5	44	0	2	0	3.0	0.1
HAL	5029	0	39	1.2	-0.2	4987	0	40	0	6.8	0.5
HBI	31	0	26	2.5	-0.5	30	0	30	0	9.1	-0.6
IBE	3465	1	5	1.5	0.4	2025	0	7	0	8.1	0.3
ICE	1041	1	5	1.7	-0.1	962	1	6	0	7.9	0.7
IWD	336	1	4	1.3	-0.1	199	0	2	0	7.3	0.5
JAA	102	2	9	1.7	1.2	99	0	6	0	6.0	2.2
JAL	2805	0	6	1.6	0.4	2785	0	6	0	7.5	0.4
JAZ	1045	0	7	1.6	0.9	1035	1	9	0	8.2	0.2
JBU	55	7	9	0.9	0.3	54	0	4	0	6.1	1.6
JMC	134	0	2	1.2	0.5	109	0	3	0	6.1	0.9
KAL	3028	1	10	1.7	0.1	3008	0	11	0	8.1	0.2
KLM	1987	0	4	1.6	0.3	1585	0	5	0	7.1	0.6
LAN	541	0	6	1.8	-0.6	539	0	7	0	6.5	1.4
LAP	45	2	16	2.0	1.4	43	0	19	0	12.0	2.5
LDA	68	4	12	1.2	0.4	53	0	11	0	5.9	-0.8
LDI	521	6	16	3.0	0.7	352	1	4	0	7.8	-0.5
LIB	501	1	5	1.9	1.0	310	0	5	0	7.7	1.4
LOB	25	0	28	3.7	-3.5	29	0	28	0	8.2	3.5
LOT	95	0	4	1.8	-1.4	91	0	7	0	5.6	0.8
LTU	863	0	6	1.7	0.1	687	0	5	0	7.0	0.9
LXR	85	0	4	1.6	0.6	49	0	6	0	7.2	1.1
MAS	316	1	6	1.5	0.4	308	0	5	0	5.9	0.1
MON	123	0	2	1.1	0.1	92	0	4	0	6.7	0.8
MPD	574	1	3	1.6	0.5	362	1	4	0	7.1	0.6
MPH	642	0	4	1.7	-0.3	559	1	5	0	7.9	0.4
MYT	381	0	3	1.5	-0.1	322	0	3	0	8.2	0.7
NCA	1020	0	3	1.8	0.1	787	0	5	0	7.9	0.1
NGA	46	0	0	1.1	0.0	34	0	0	0	5.2	0.9
NWA	9448	0	9	1.6	0.3	9362	0	10	0	7.6	0.3
NZL	3989	0	13	1.6	0.0	3989	0	13	0	5.5	0.8
OAE	214	0	43	1.5	-0.1	216	0	42	0	6.5	-0.1
PAC	872	1	19	1.6	0.2	879	0	19	0	7.6	0.3
PAL	1246	0	9	1.5	0.0	1151	0	9	0	8.3	0.9
PAO	397	0	64	1.3	0.5	400	0	64	0	10.2	0.8
QFA	2884	0	46	1.4	0.4	2894	0	46	0	6.1	0.1
RAF	21	0	0	1.6	1.4	20	0	0	0	6.1	0.3
RAM	282	2	5	1.8	0.1	152	0	6	0	10.4	0.2
RCH	395	2	100	3.0	0.2	337	1	100	0	9.5	1.8
RJA	37	0	14	3.0	-1.2	38	0	8	0	8.4	2.9
RON	21	0	43	0.8	0.2	21	0	43	0	5.4	-0.5
RRR	234	1	9	2.1	-0.6	213	0	9	0	6.8	1.0
RYN	130	2	75	3.0	-1.0	127	0	44	0	6.5	-0.7
RZO	454	0	3	1.7	0.1	216	1	3	0	7.5	0.8

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	PG	WIND		RMS	BIAS
		PG	PR	RMS	PR				PC			
SAA	359	0	3	1.5	-0.4		283	1	2	0	7.3	0.9
SIA	223	0	3	1.6	0.0		229	0	3	0	6.6	-0.1
SLR	230	0	4	1.2	0.2		212	0	6	0	7.3	1.0
SOO	41	2	12	2.7	1.1		68	0	9	0	9.9	-1.1
SQC	52	0	6	1.4	0.5		52	0	8	0	7.1	0.9
SVA	45	2	16	2.5	0.3		44	0	11	0	10.6	-0.3
TAG	23	0	9	2.0	-0.1		24	0	8	0	4.2	0.4
TAP	763	1	5	1.6	0.0		307	0	6	0	8.2	0.9
TCV	32	0	3	1.5	1.1		26	0	4	0	8.1	-1.1
THA	156	0	5	1.7	0.0		155	0	7	0	7.3	-0.7
THT	181	1	28	1.9	0.6		167	0	24	0	6.3	0.8
TPA	22	0	5	0.8	0.3		22	0	5	0	7.5	0.4
TSC	221	0	3	1.5	0.1		177	1	6	0	8.0	1.8
UAL	250648	0	96	1.1	-0.2		250683	0	96	0	4.7	0.4
UPS	2187	1	55	1.8	0.2		2150	0	54	0	6.8	0.1
USA	193	2	3	1.3	0.0		147	0	3	0	8.2	0.5
VIR	273	0	3	1.3	-0.2		242	0	4	0	8.1	0.8
VRG	102	3	15	1.8	1.1		99	0	14	0	9.9	1.4
VVJ	31	3	16	3.0	-2.3		33	0	12	0	12.9	1.2
VVR	55	2	25	2.4	1.2		52	4	23	0	6.4	0.5
WOA	270	1	13	1.8	0.2		263	0	16	0	8.5	0.8
YSS	113	1	6	1.4	1.0		76	0	7	0	9.7	2.2
9VS	67	0	1	1.3	0.0		64	0	2	0	4.6	1.1
AR	1517	1	100	3.2	2.2		1513	0	4	0	6.2	1.3
AU	37161	0	13	1.2	0.4		37330	0	13	0	5.1	0.4
EU	148631	0	25	1.3	0.2		148631	0	25	0	4.6	0.4
KL	1886	1	20	1.8	0.7		1879	0	21	0	10.2	0.7
LH	1949	0	12	1.5	1.0		1940	0	12	0	4.7	0.7
MK	4172	1	18	3.3	2.6		4152	0	10	0	8.2	0.9
SA	5602	0	47	1.8	1.2		5603	0	12	0	7.5	0.8
TN	52	0	25	2.0	1.0		50	0	26	0	7.5	1.1
N	1673	1	13	1.6	0.2		1630	0	14	0	6.4	0.6
US ACARS	1066287	1	62	1.2	0.3		1066281	0	61	0	5.1	0.5

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period	:One calendar month.
Data monitored	:Statistics for each airline carrier.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from UKMO global model.
Observation times	:All hours combined.
Level(s) monitored	:1000.0 – 300.1 hPa
Elements monitored	:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	
:N REP.	:Number of observations received excluding duplicates.
:PG	:Percentage of observations with gross errors.
:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC	:Percentage of observations with calm winds.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind
SELECTION CRITERIA	:N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
AAL	227	1	28	1.6	-0.5	204	0	29	0	6.1	1.1
AAR	29	0	24	1.9	-0.9	29	0	24	0	5.9	-1.0
ACI	25	0	68	2.2	-0.9	25	0	68	0	7.6	2.3
ADB	33	0	52	1.8	-1.0	30	0	50	0	9.4	-3.3
AFR	79	0	4	1.5	0.3	69	1	3	0	7.4	1.1
ANZ	253	1	49	1.6	-0.3	253	1	49	0	6.6	0.2
ATN	88	2	18	2.7	-0.1	85	1	13	0	9.8	1.5
AXF	41	0	63	0.8	0.2	41	0	63	0	6.0	-0.8
AZA	34	18	26	3.4	1.5	32	0	3	0	9.2	1.1
CES	23	0	35	0.6	0.1	23	0	35	0	4.5	0.0
CFC	83	0	13	2.4	0.6	71	0	13	0	8.1	-0.2
CFG	31	3	3	1.2	-0.2	25	0	8	0	7.9	1.1
CIU	32	0	16	2.5	0.8	29	3	14	0	13.2	2.3
CLX	26	4	15	1.9	-0.8	25	0	12	0	5.8	-1.7
CMI	27	0	15	2.2	-1.1	26	0	8	0	6.6	0.8
COA	74	1	45	0.9	-0.3	74	0	45	0	5.9	0.1
CUB	50	0	12	1.9	1.0	31	0	10	0	7.5	0.2
DAL	218	0	46	1.4	-0.3	213	0	48	0	8.2	1.2
DLH	204	0	12	1.7	0.0	200	0	14	0	8.5	0.7
EWV	124	0	3	1.6	0.7	119	0	8	0	9.2	1.3
FDX	487	1	33	1.2	0.3	491	0	33	0	7.4	0.2
FIN	23	0	0	1.3	0.0	21	0	10	0	10.6	-1.1
FJI	24	13	63	2.2	1.4	24	0	58	0	13.5	2.9
FWQ	24	0	42	0.8	-0.4	23	9	43	0	4.7	-1.9
GAF	51	0	0	1.2	0.2	50	0	2	0	7.2	0.9
GCO	125	4	26	1.3	0.0	124	1	50	0	7.9	1.1
GTI	42	0	10	1.5	-0.7	44	0	11	0	6.6	0.3
HAL	157	1	46	1.7	-0.5	158	0	47	0	7.4	0.2
IBE	49	0	12	2.0	0.2	35	0	9	0	5.9	1.0
ICE	49	0	8	2.3	-1.2	37	3	8	0	9.4	-0.4
JAA	60	3	5	1.7	0.6	59	0	3	0	6.7	0.8
JAL	97	1	3	1.9	0.4	95	0	3	0	8.3	2.6
JAZ	129	1	7	1.8	1.0	128	0	6	0	8.6	1.2
KAL	80	0	24	1.7	0.0	75	0	23	0	6.5	1.1
KIW	39	0	33	3.4	2.0	34	0	29	0	8.8	0.2
KLM	62	0	0	1.4	0.5	53	0	4	0	10.0	-0.5
LAN	22	0	0	0.8	-0.1	22	0	0	0	5.3	0.8
LIB	71	0	6	1.7	1.0	43	0	5	0	7.9	1.3
MAS	33	0	24	1.1	-0.1	31	0	23	0	4.7	0.2
MPH	76	0	1	1.5	-0.2	72	0	1	0	5.8	-0.2
NCA	136	1	1	1.8	0.3	111	0	2	0	7.0	0.0
NWA	351	0	7	1.5	0.3	348	0	8	0	7.9	-1.1
NZL	21256	0	57	1.3	0.4	21256	0	57	0	5.3	-0.1
PAC	105	1	25	1.3	-0.2	107	0	23	0	6.5	0.1
QFA	141	0	48	2.1	-0.3	143	0	44	0	6.3	0.2
RCH	95	1	100	4.1	-3.0	81	0	100	0	10.4	2.9
RRR	189	6	20	2.3	0.6	187	0	18	0	11.9	1.1
SAA	39	10	13	1.4	-1.1	38	0	3	0	5.9	-1.0
SIA	37	0	0	1.3	0.6	37	0	0	0	4.3	1.0
SKI	37	8	43	3.3	-0.2	60	10	43	0	17.6	-0.4
UAL	564619	0	99	1.2	-0.1	563782	0	99	0	4.0	0.3
UPS	125	1	44	1.7	0.0	119	1	45	0	6.4	0.8
VTA	28	4	57	2.5	-1.3	37	0	43	0	6.2	2.4
VVP	24	4	13	2.8	0.7	30	0	23	0	15.1	1.6
WOA	32	0	0	2.4	-0.1	43	0	12	0	10.2	1.4

IDENT.	N.REP.	TEMPERATURE				N.REP.	PG	WIND			RMS	BIAS
		PG	PR	RMS	BIAS			PR	PC			
AR	938	0	100	2.2	1.5	935	0	48	0	4.8	0.6	
AU	28001	0	50	1.3	0.4	28222	0	50	0	4.6	-0.1	
EU	561933	0	67	1.0	0.1	559295	0	67	0	4.0	-0.1	
KL	1094	1	53	1.7	0.6	1101	1	53	0	7.0	-0.1	
LH	754	0	61	1.1	0.5	750	0	61	0	4.2	0.6	
MK	2634	0	59	2.5	1.7	2626	0	56	0	5.3	0.7	
SA	4105	0	72	1.8	0.5	4105	0	58	0	5.1	0.0	
N	50	18	34	2.1	-0.6	52	2	25	0	8.3	-0.3	
US ACARS	1963692	0	77	1.2	0.2	1958817	0	77	0	4.1	0.3	

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. OCTOBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 51827

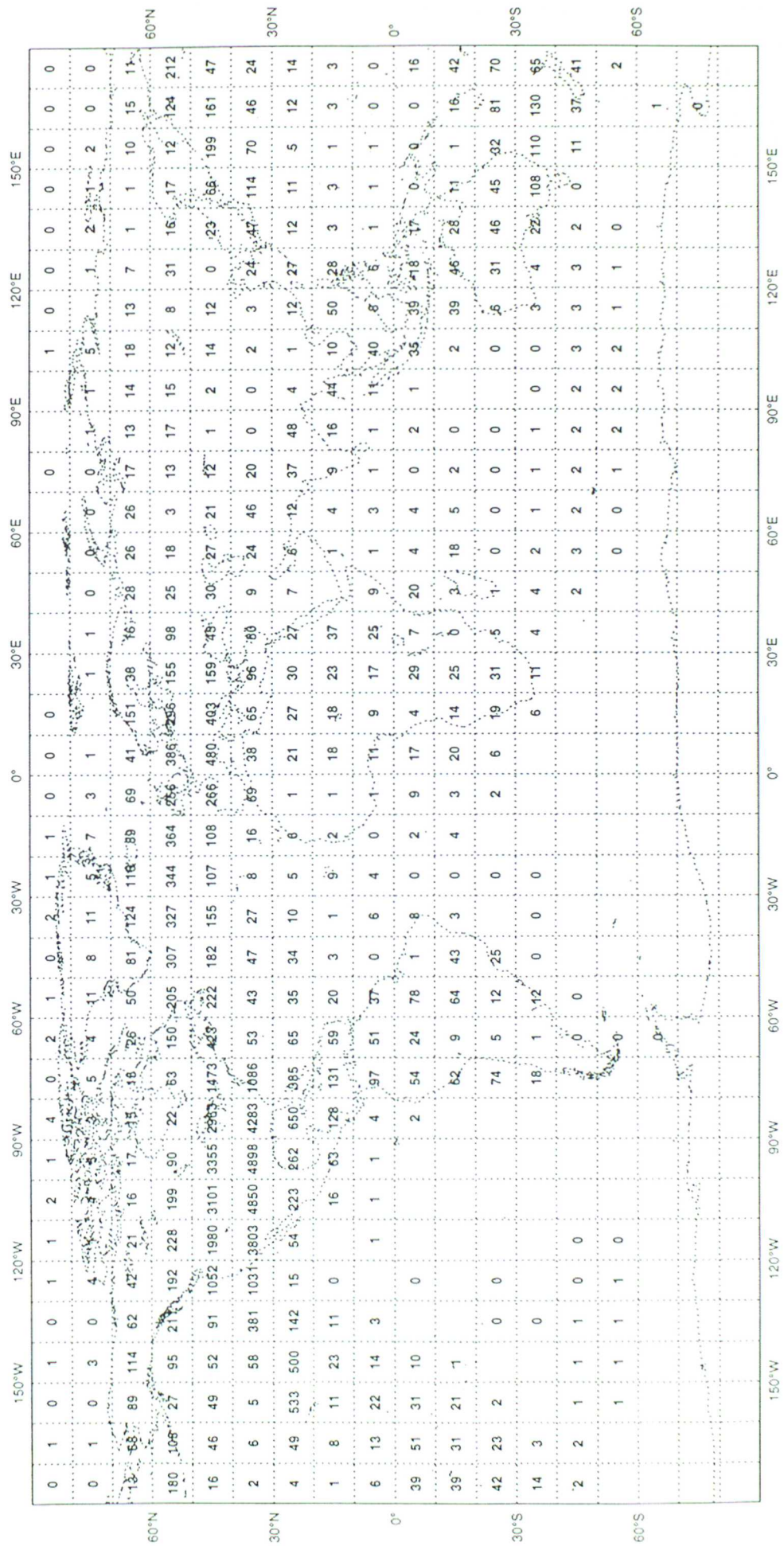
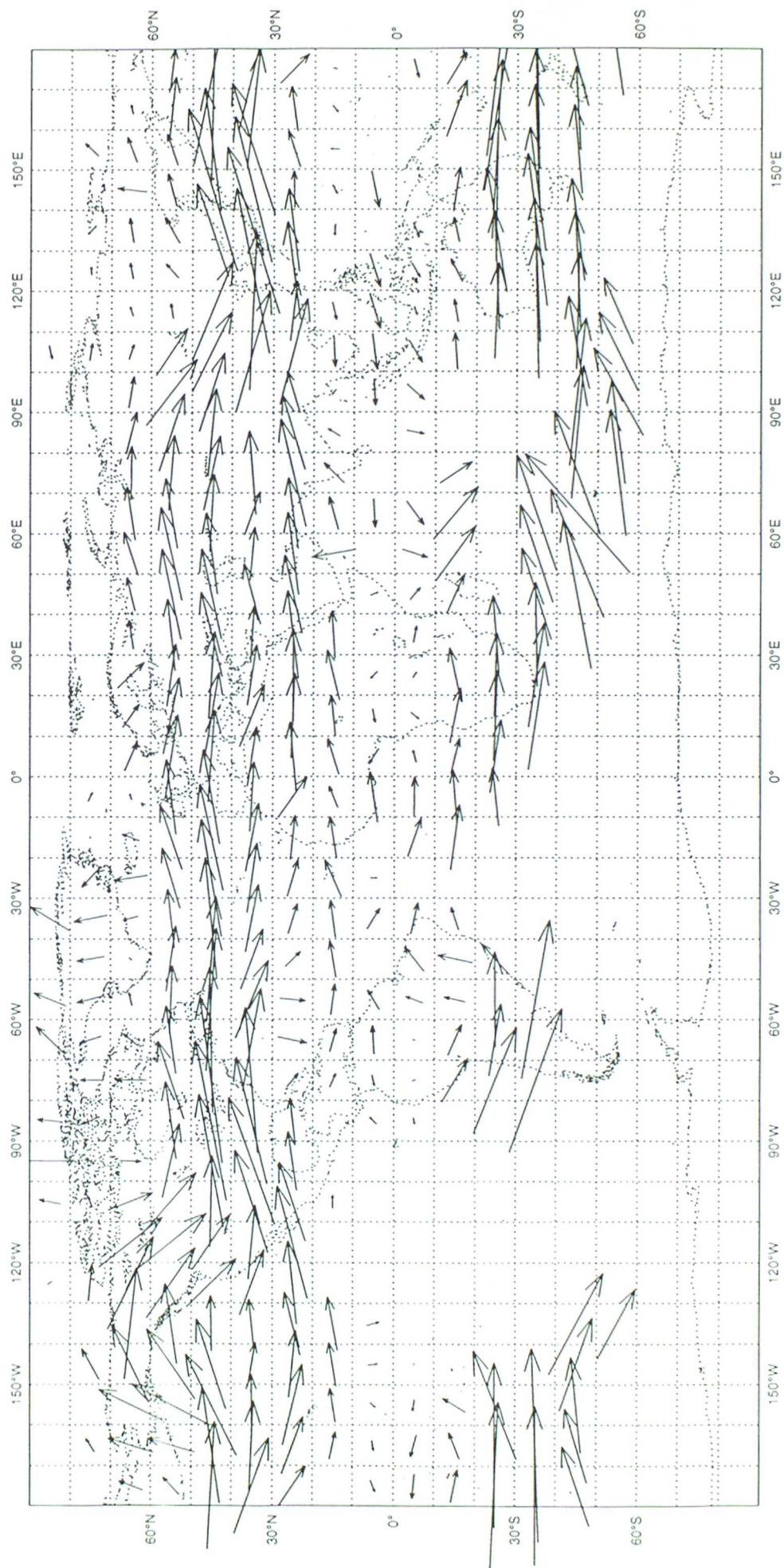


Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. OCTOBER 2002
 Observations with O-B vector difference greater than 60 ms⁻¹ excluded
 Arrows are plotted where greater than 30 obs are present



15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. OCTOBER 2002
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Arrows are plotted where greater than 30 obs are present

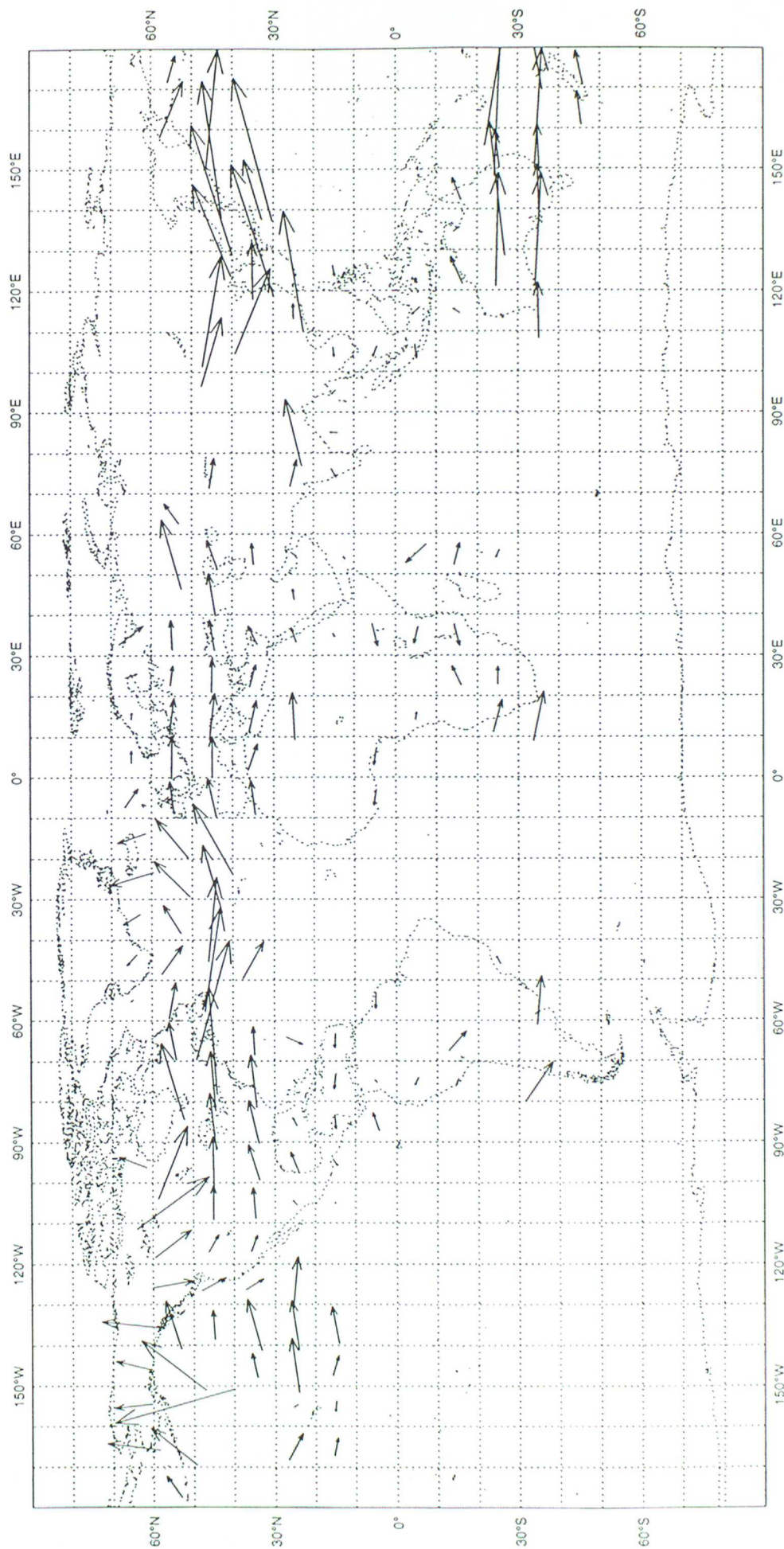


Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. OCTOBER 2002
 Observations with O-B vector difference greater than 60 ms⁻¹ excluded
 Arrows are plotted where greater than 30 obs are present

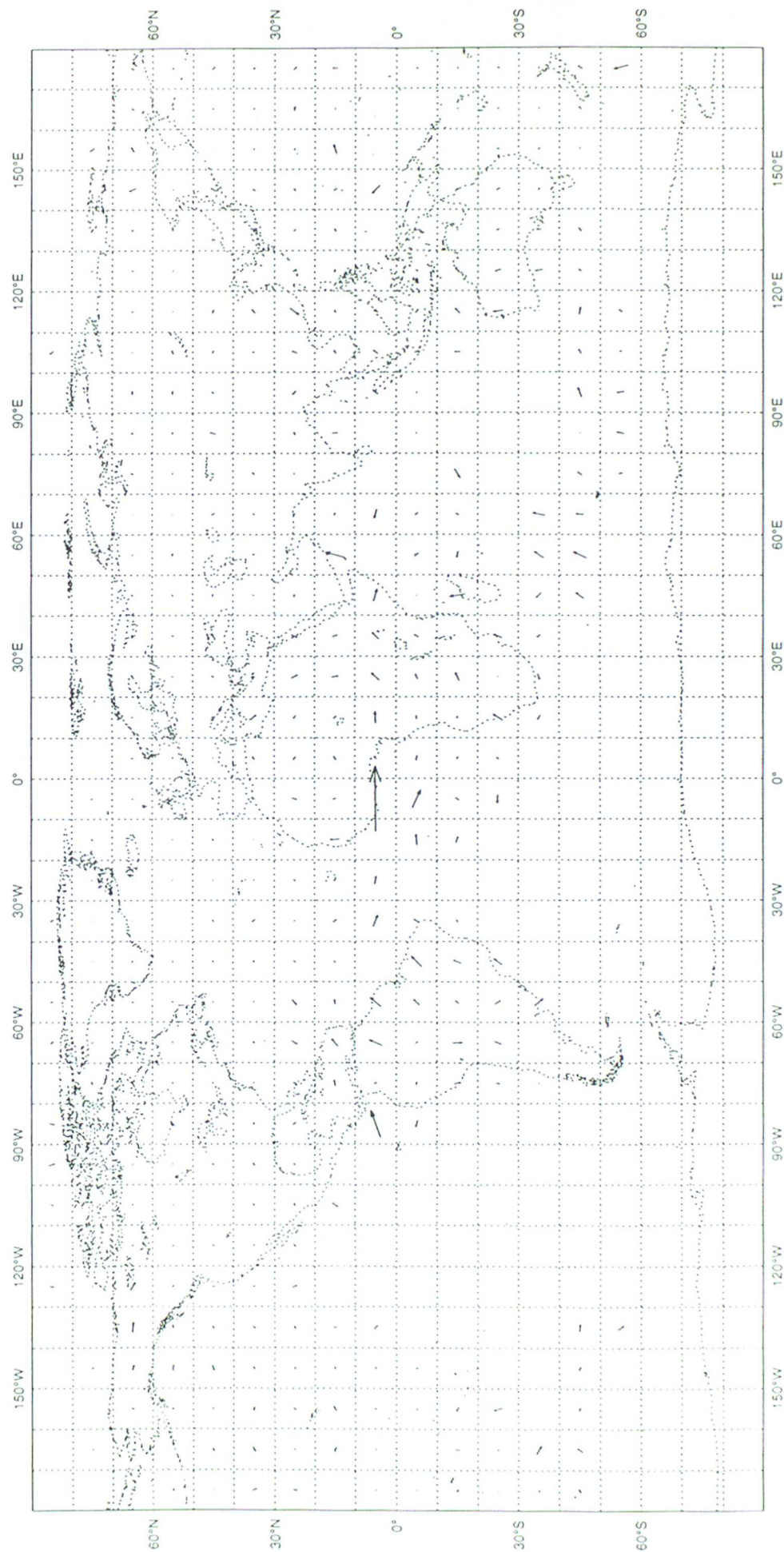
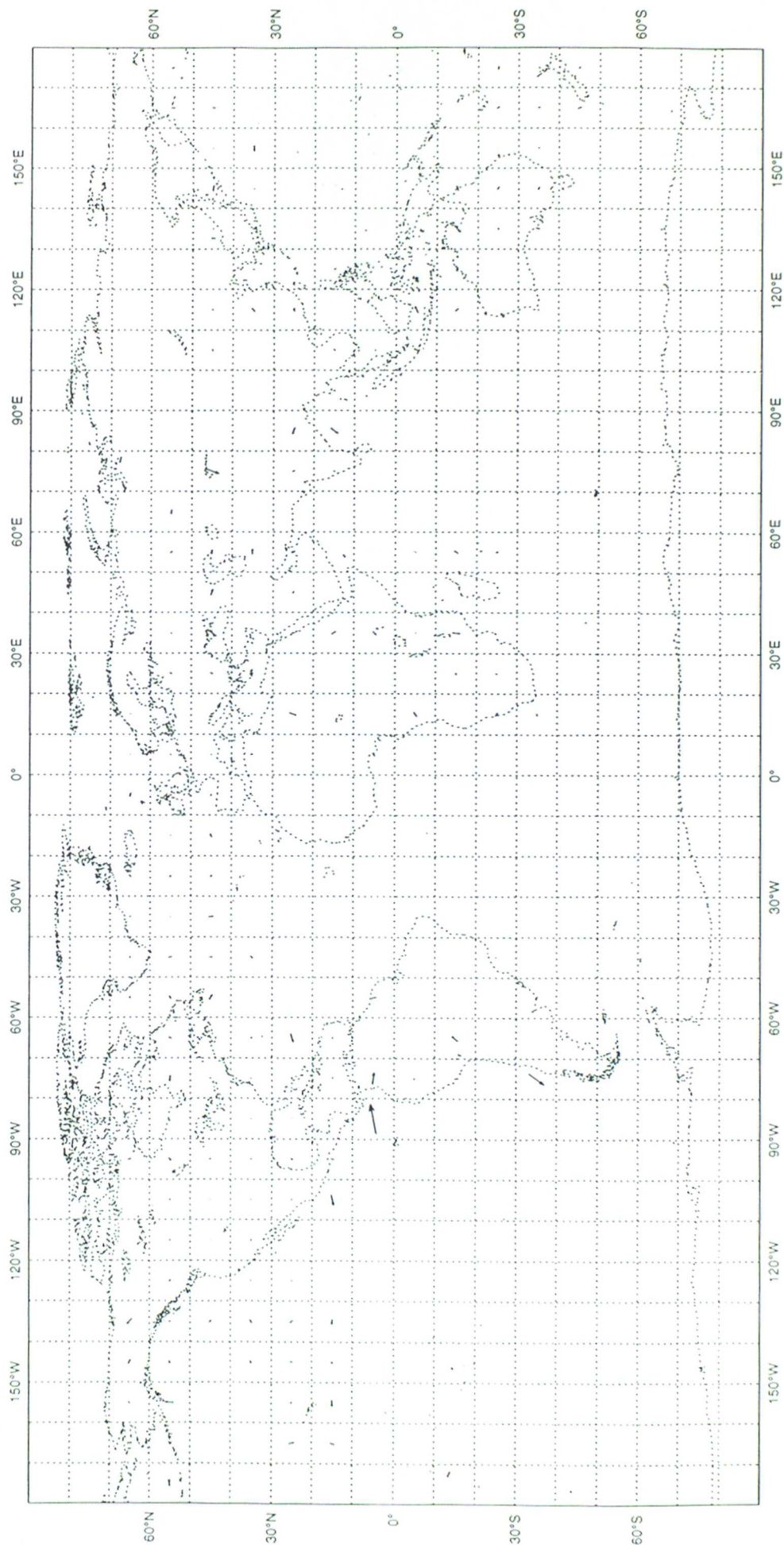


Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. OCTOBER 2002
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Arrows are plotted where greater than 30 obs are present



15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). OCTOBER 2002
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Values are printed where greater than 30 obs are present

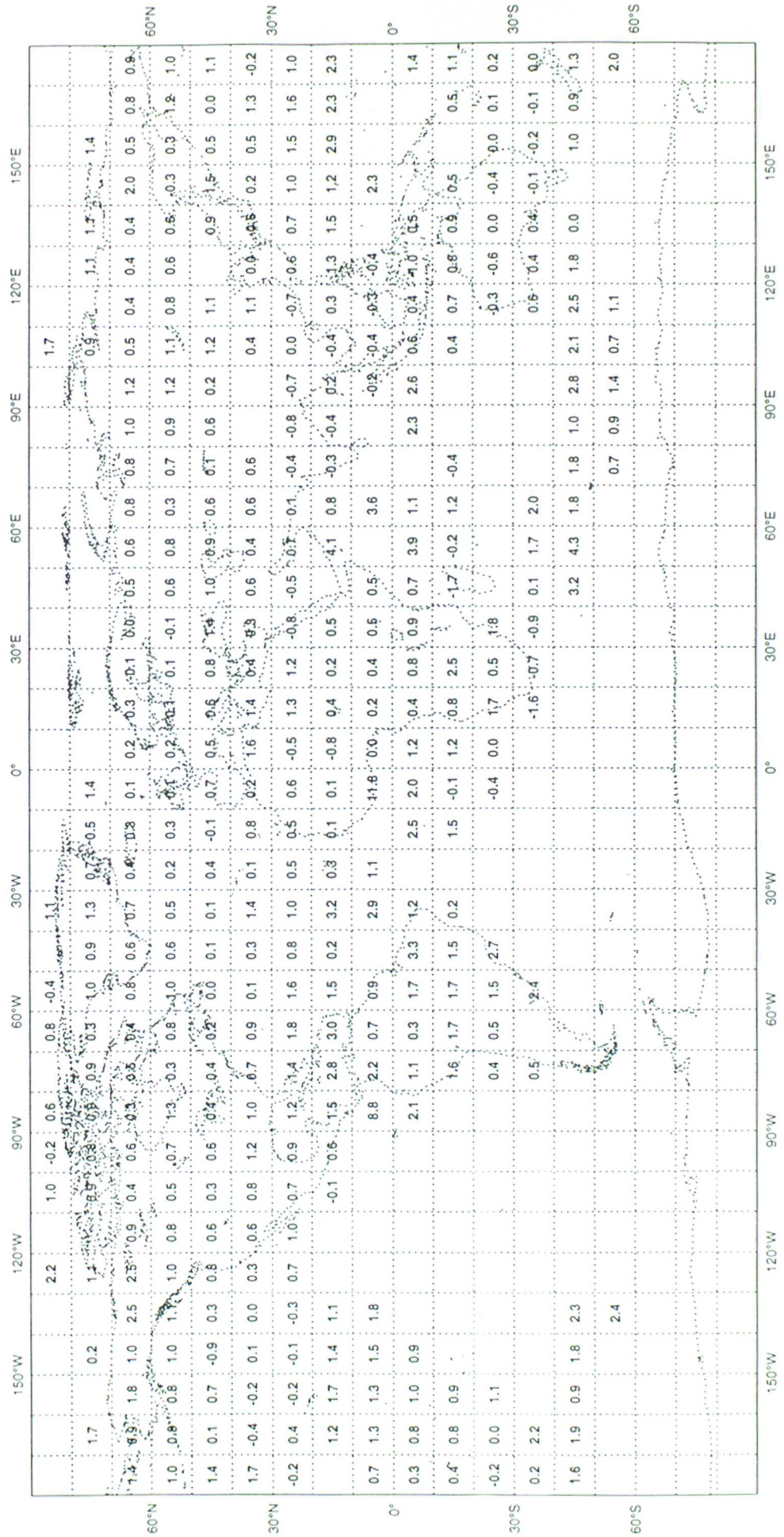


Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms⁻¹). OCTOBER 2002
 Observations with O-B vector difference greater than 60 ms⁻¹ excluded
 Values are printed where greater than 30 obs are present

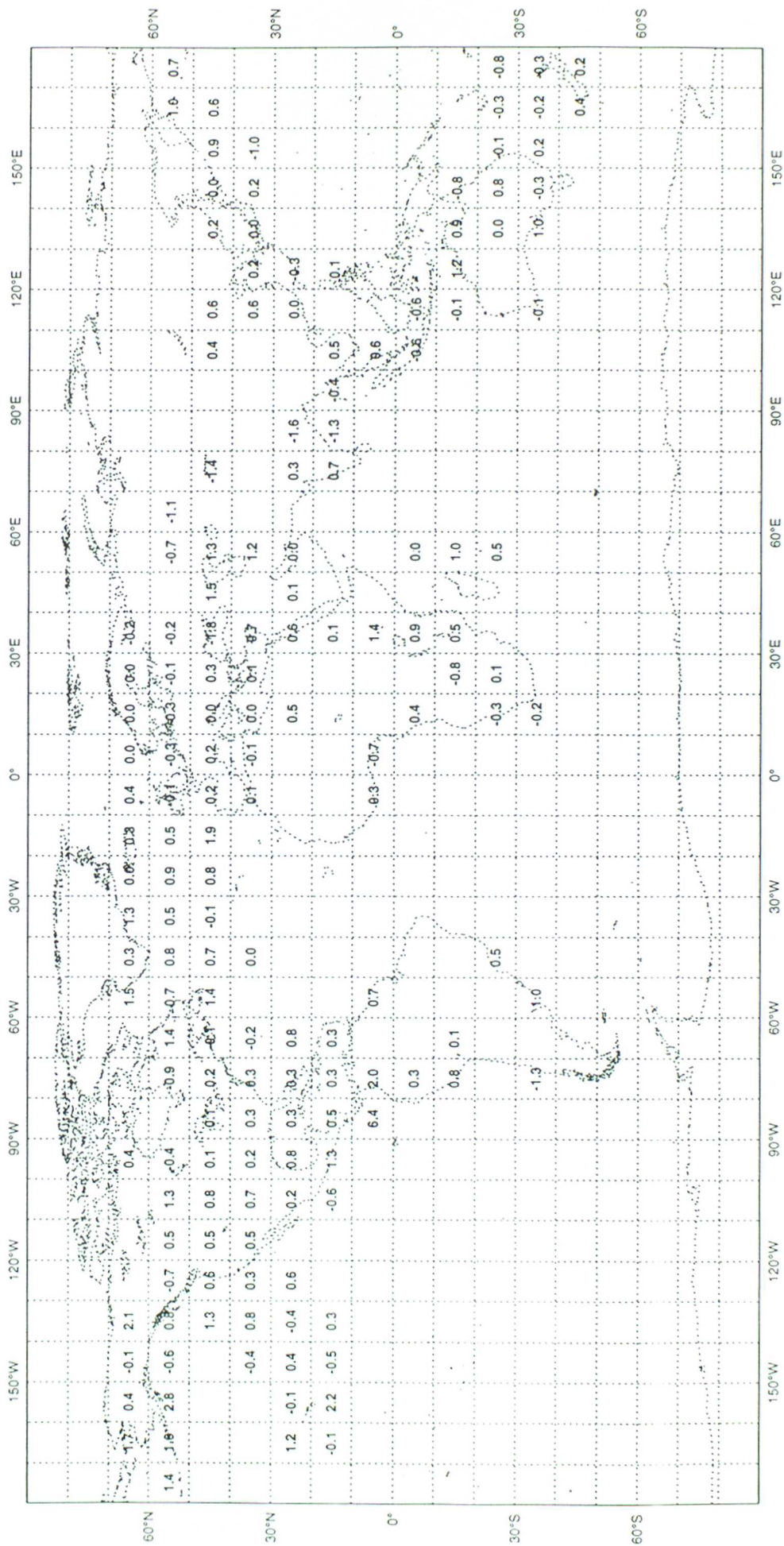


Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). OCTOBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

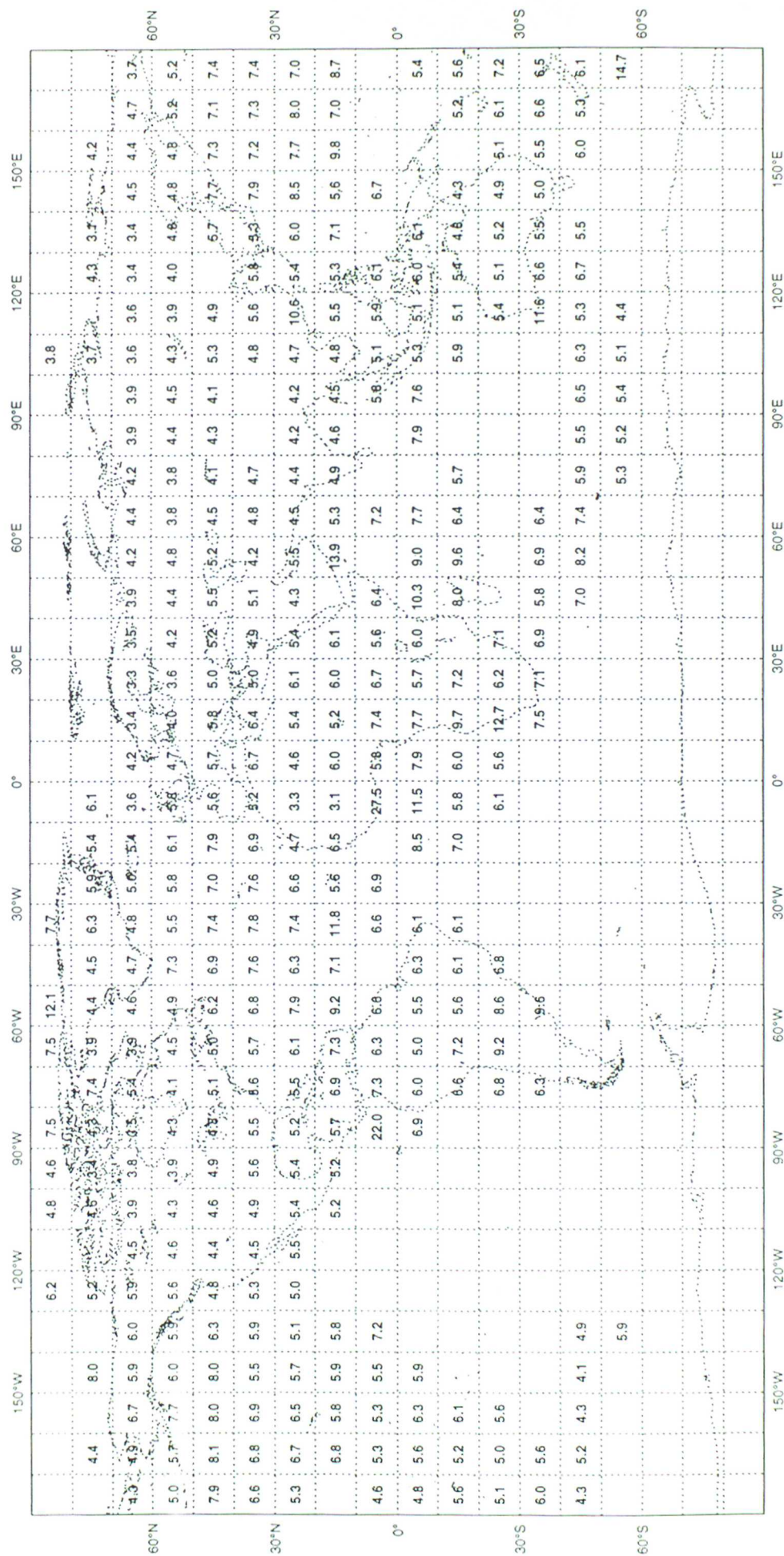


Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). OCTOBER 2002
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Values are printed where greater than 30 obs are present

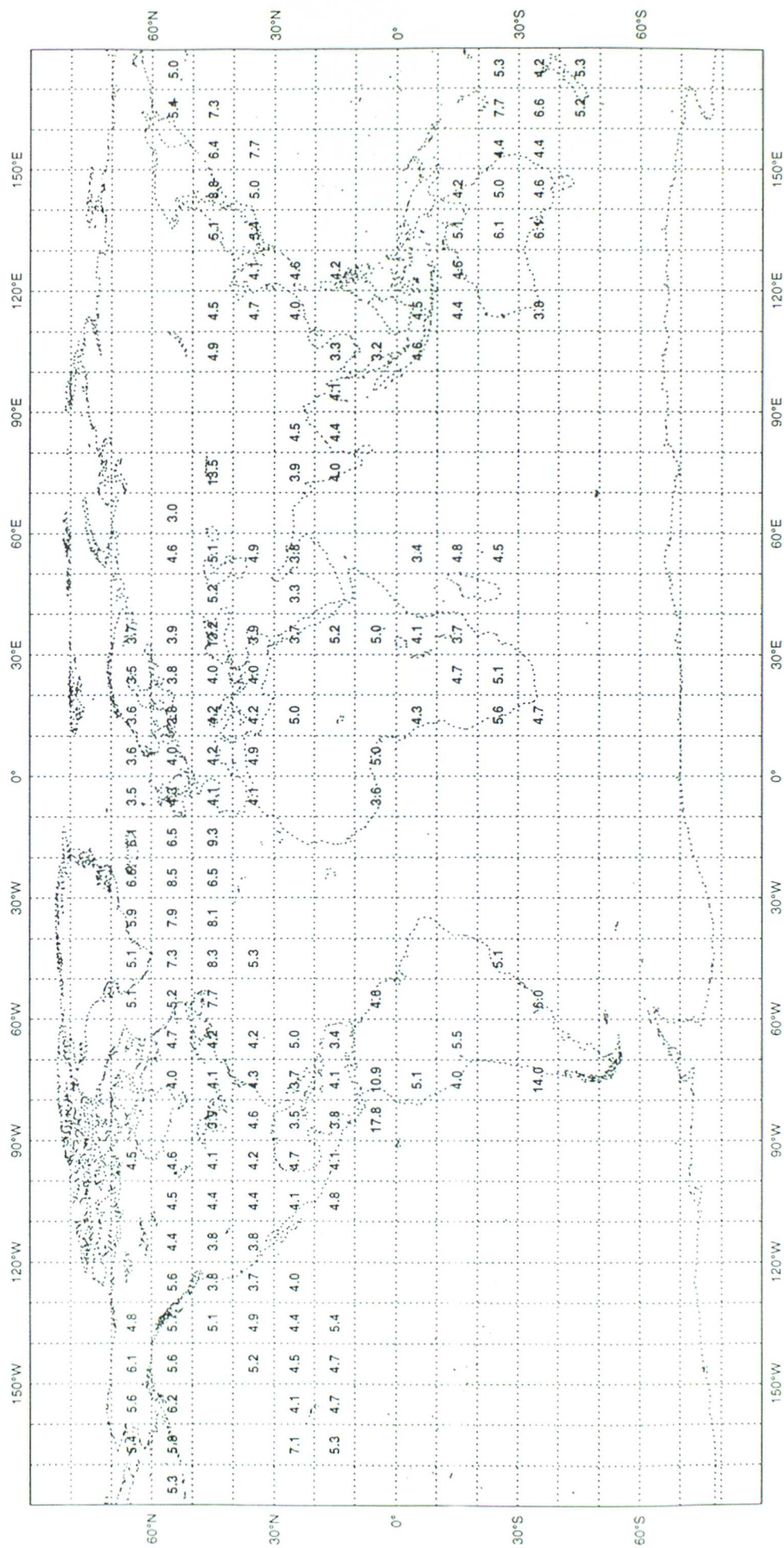


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS		:Defined in Appendix I.1
SELECTION CRITERIA		: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
32098	00	Z	250	49/ 143	21	0	54.3	89.5	104.7	7
34731	00	Z	400	47/ 40	21	0	31.2	-55.9	64.0	6
41594	12	Z	150	32/ 73	10	0	108.2	61.8	124.6	4
42314	12	Z	200	27/ 95	14	0	62.3	-86.6	106.7	4
42339	12	Z	70	26/ 73	13	0	142.8	106.4	178.1	6
42361	00	Z	1000	26/ 78	3	21	25.7	-64.7	69.6	7
42361	12	Z	200	26/ 78	15	1	83.0	-65.7	105.9	7
42369	00	Z	1000	27/ 81	23	0	14.7	-46.1	48.4	9
42369	12	Z	1000	27/ 81	22	0	16.1	-60.3	62.4	8
42379	00	Z	50	27/ 83	10	0	101.5	232.7	253.9	7
42379	12	Z	400	27/ 83	24	0	39.8	42.7	58.4	6
42397	00	Z	150	27/ 88	15	0	84.5	-92.3	125.2	6
42647	00	Z	250	23/ 73	13	0	85.8	-44.5	96.7	5
42701	00	Z	250	23/ 85	21	1	75.9	-45.3	88.4	7
42701	12	Z	150	23/ 85	15	0	93.2	-58.5	110.0	6
42867	00	Z	30	21/ 79	10	0	121.7	181.2	218.3	5
42971	12	Z	50	20/ 86	13	0	133.4	107.3	171.2	6
43003	00	Z	1000	19/ 73	24	4	10.5	-75.3	76.1	8
43003	12	Z	1000	19/ 73	24	6	9.0	-85.8	86.3	7
43014	00	Z	200	20/ 75	11	0	120.8	0.2	120.8	5
43014	12	Z	200	20/ 75	17	0	104.7	-39.7	112.0	4
43041	00	Z	150	19/ 82	12	1	104.0	-22.8	106.5	6
43041	12	Z	200	19/ 82	18	0	64.5	-70.1	95.3	4
43192	00	Z	100	15/ 74	16	0	75.1	-103.9	128.2	6
43279	12	Z	50	13/ 80	11	2	70.7	239.5	249.8	6
43311	00	Z	200	11/ 73	18	0	71.9	-62.1	95.0	4
43346	00	Z	100	11/ 80	26	0	110.9	-64.8	128.4	4
43346	12	Z	30	11/ 80	14	0	99.6	232.6	253.1	5
43353	00	Z	1000	10/ 76	22	5	8.9	-88.4	88.9	6
43353	12	Z	1000	10/ 76	12	13	8.0	-90.1	90.4	5
43371	12	Z	30	8/ 77	14	0	122.0	248.4	276.7	4
44292	00	Z	30	48/ 107	14	0	47.3	297.5	301.2	5
58968	00	Z	1000	25/ 122	29	0	19.8	-54.1	57.6	5
83746	12	Z	1000	-23/ -43	15	14	15.0	-82.9	84.3	4
84628	12	Z	850	-12/ -77	20	0	10.3	-66.7	67.5	6
89512	12	Z	70	-71/ 12	12	1	109.1	259.5	281.5	8
91366	00	Z	50	9/ 168	23	2	100.7	172.9	200.1	5

Figure 8. TEMP 500 hPa geopotential mean daily count. OCTOBER 2002
 All hours
 Global average number of observations in 24 hours = 1143

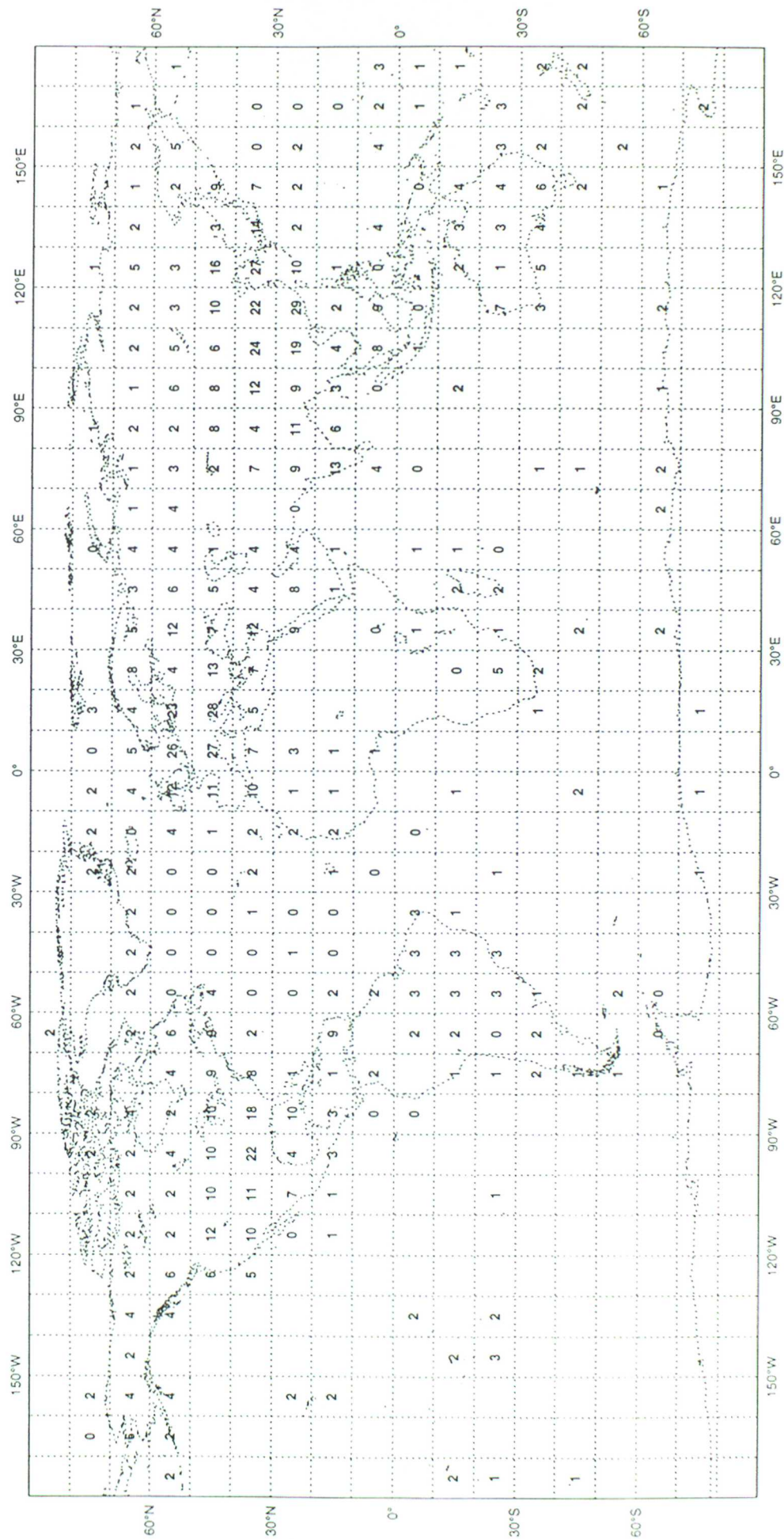


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and $\geq 15 \text{ m s}^{-1}$ RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
FNPH	12	V	400	22/ -55	10	0	10	-2.5	-4.2	15.2	1
PSPIU	00	V	150	-5/ -81	31	0	100	-4.0	0.1	16.7	2
PSPIU	12	V	150	-5/ -81	29	0	100	-3.3	3.1	19.0	3
07110	00	V	250	48/ -4	31	0	9	-1.7	-0.1	15.3	1
41594	12	V	100	32/ 73	9	0	100	15.7	1.7	19.6	1
42369	00	V	100	27/ 81	12	0	100	2.9	2.9	15.5	1
42410	12	V	250	26/ 92	15	0	100	-13.3	2.6	18.5	2
47122	12	V	200	37/ 127	29	0	6	-2.5	-3.1	16.5	1
60360	12	V	250	37/ 8	21	0	100	5.2	-4.7	15.5	2
68263	12	V	100	-26/ 28	11	0	100	-0.8	-1.7	15.2	1
68512	12	V	150	-30/ 18	17	0	100	-10.8	-1.1	15.7	1
68842	12	V	250	-34/ 26	12	0	100	-14.3	1.5	21.5	3
83362	12	V	300	-16/ -56	28	0	3	-1.3	-3.3	16.7	1
85586	12	V	100	-34/ -72	28	0	17	-8.9	-3.9	15.4	1
87576	12	V	200	-35/ -59	24	0	4	-3.8	-2.0	30.3	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. OCTOBER 2002
 All hours
 Global average number of observations in 24 hours = 1348

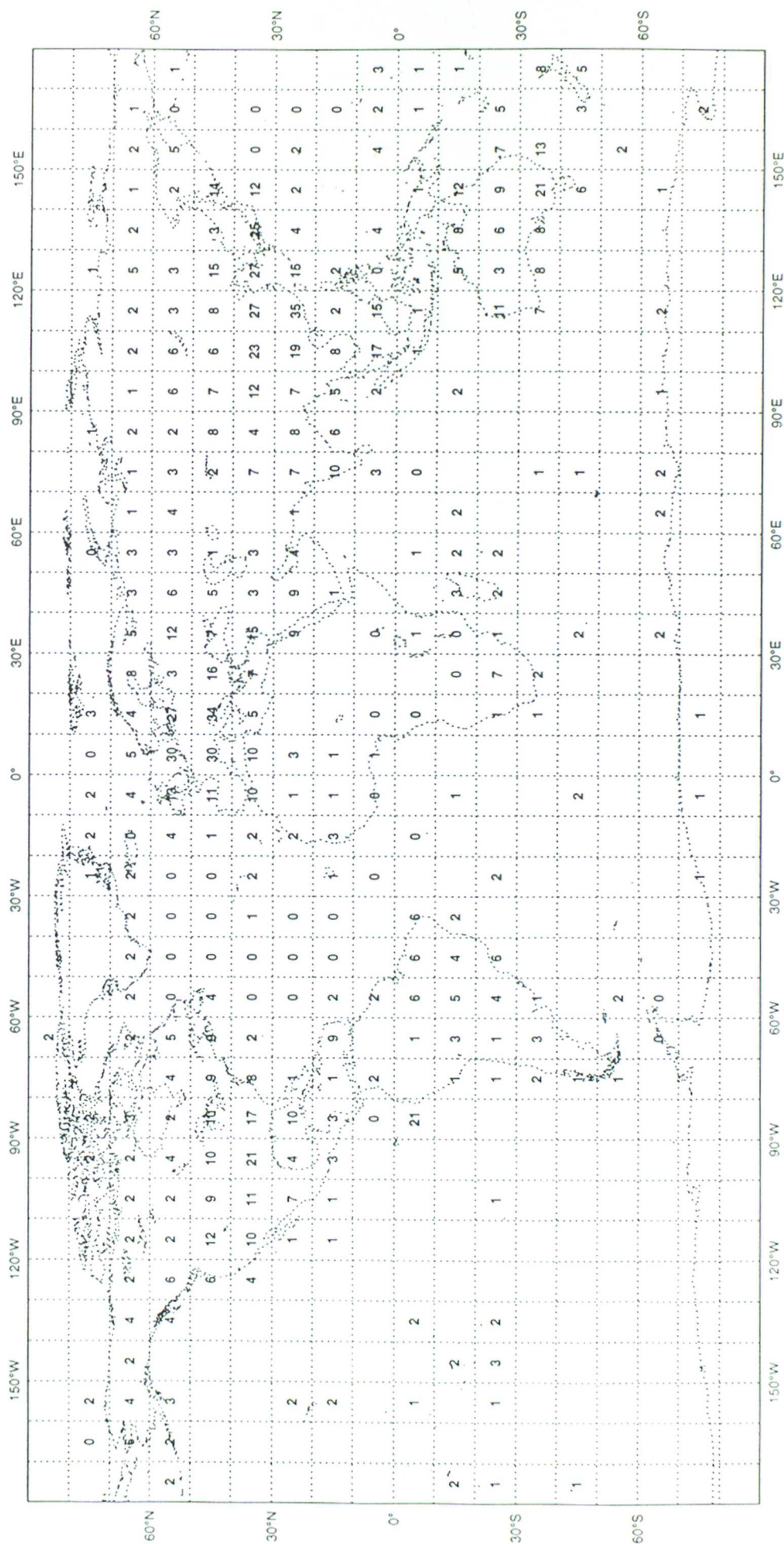


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from UKMO global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 500.0 - 150.0 hPa
Element monitored	:WIND DIRECTION in degrees
Parameters monitored	
	:NUM OBS :Average number of observations at all levels.
	:BIAS :Mean difference of observations from background values from all levels.
	:MAX SPREAD : (For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD :SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5 , and ABSOLUTE BIAS $\geq 10^\circ$, with SD $< 30^\circ$, and MAX SPREAD $< 10^\circ$

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
08594	12	DD	17/ -23	16	-10.5	9.4	23.5
10468	00	DD	52/ 12	29	15.1	2.8	7.9
10468	12	DD	52/ 12	29	13.5	1.9	7.7
17030	00	DD	41/ 36	28	14.3	6.3	14.4
17030	12	DD	41/ 36	27	13.3	4.2	10.9
17280	12	DD	38/ 40	27	-11.8	4.2	12.2
29612	12	DD	55/ 78	23	23.9	1.8	7.4
42809	00	DD	23/ 88	25	10.3	6.1	12.7
59758	00	DD	20/ 110	16	10.3	8.7	21.1
59758	12	DD	20/ 110	19	13.2	6.1	21.7
60490	12	DD	36/ -1	21	-11.3	4.7	15.1
91408	00	DD	7/ 134	20	12.3	9.8	25.5
92044	00	DD	-2/ 147	7	13.6	9.7	26.1

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: October 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 11. SATOB 701 - 1000 hPa vector mean wind. OCTOBER 2002
 All observations
 Arrows are plotted where greater than 10 obs are present

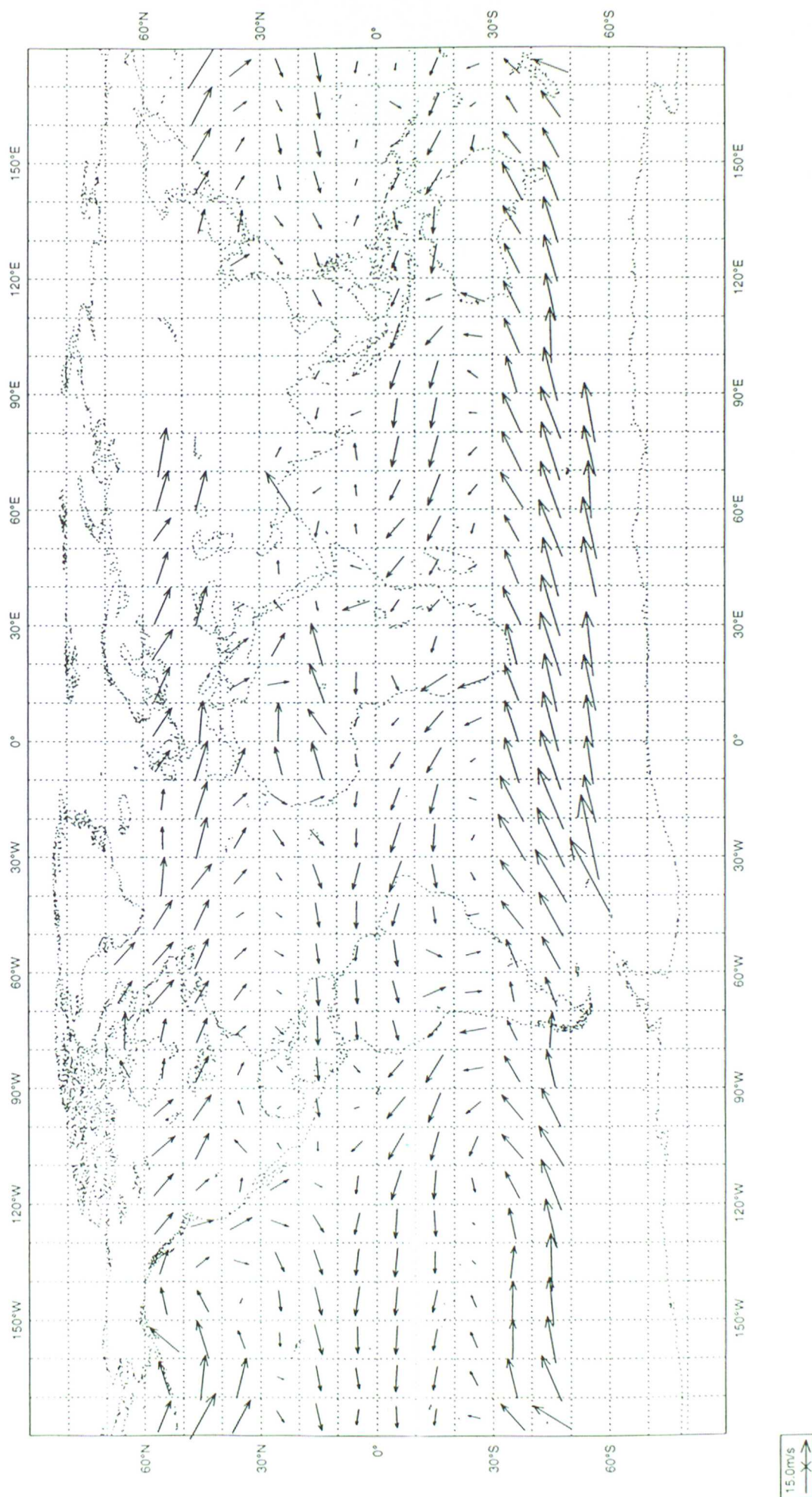


Figure 12. SATOB 701 - 1000 hPa vector wind differences. OCTOBER 2002
 All observations
 Arrows are plotted where greater than 10 obs are present

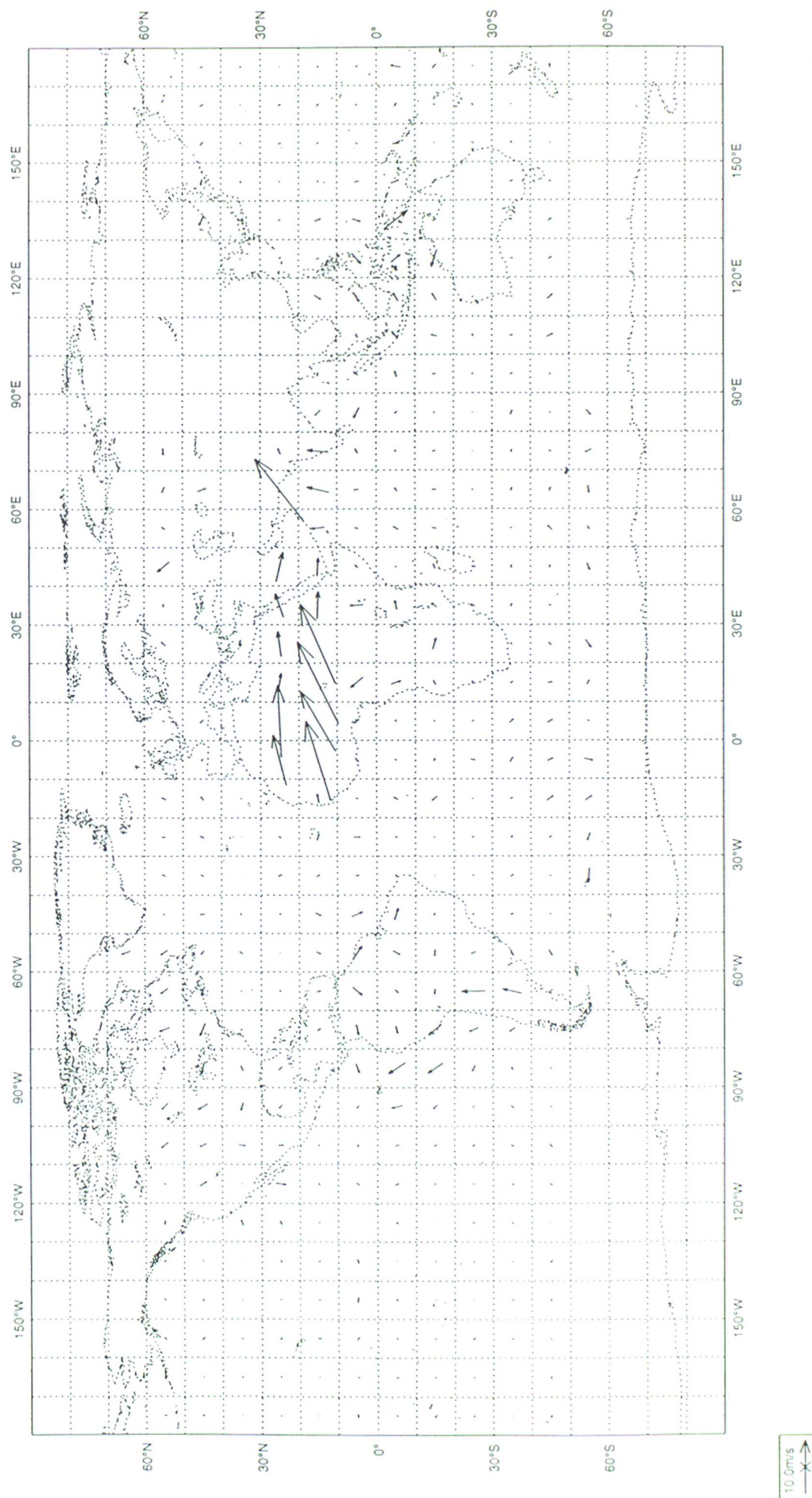


Figure 16. SATOB 401 - 700 hPa vector mean wind. OCTOBER 2002

All observations

Arrows are plotted where greater than 10 obs are present

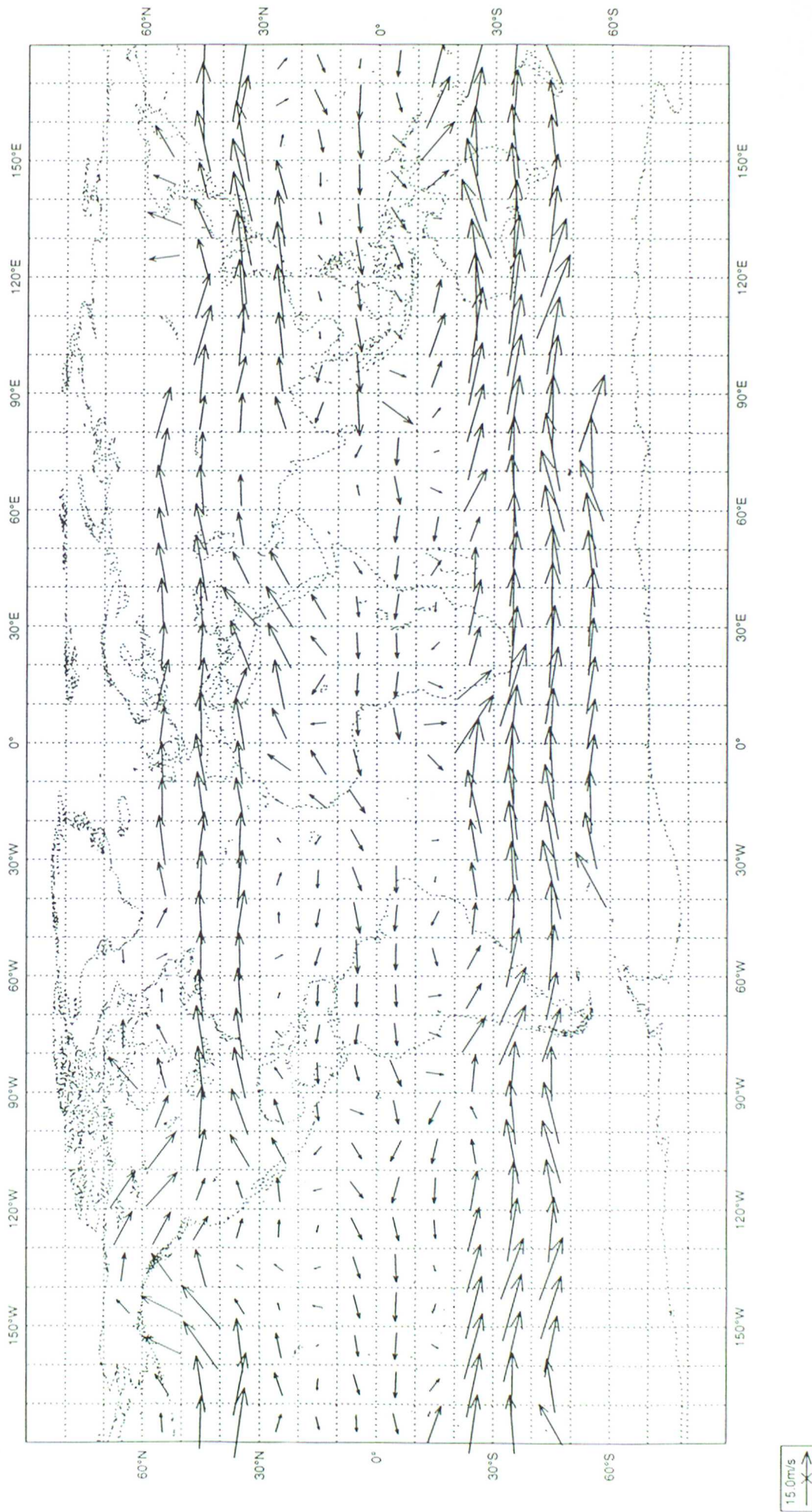


Figure 17. SATOB 401 - 700 hPa vector wind differences. OCTOBER 2002
 All observations
 Arrows are plotted where greater than 10 obs are present

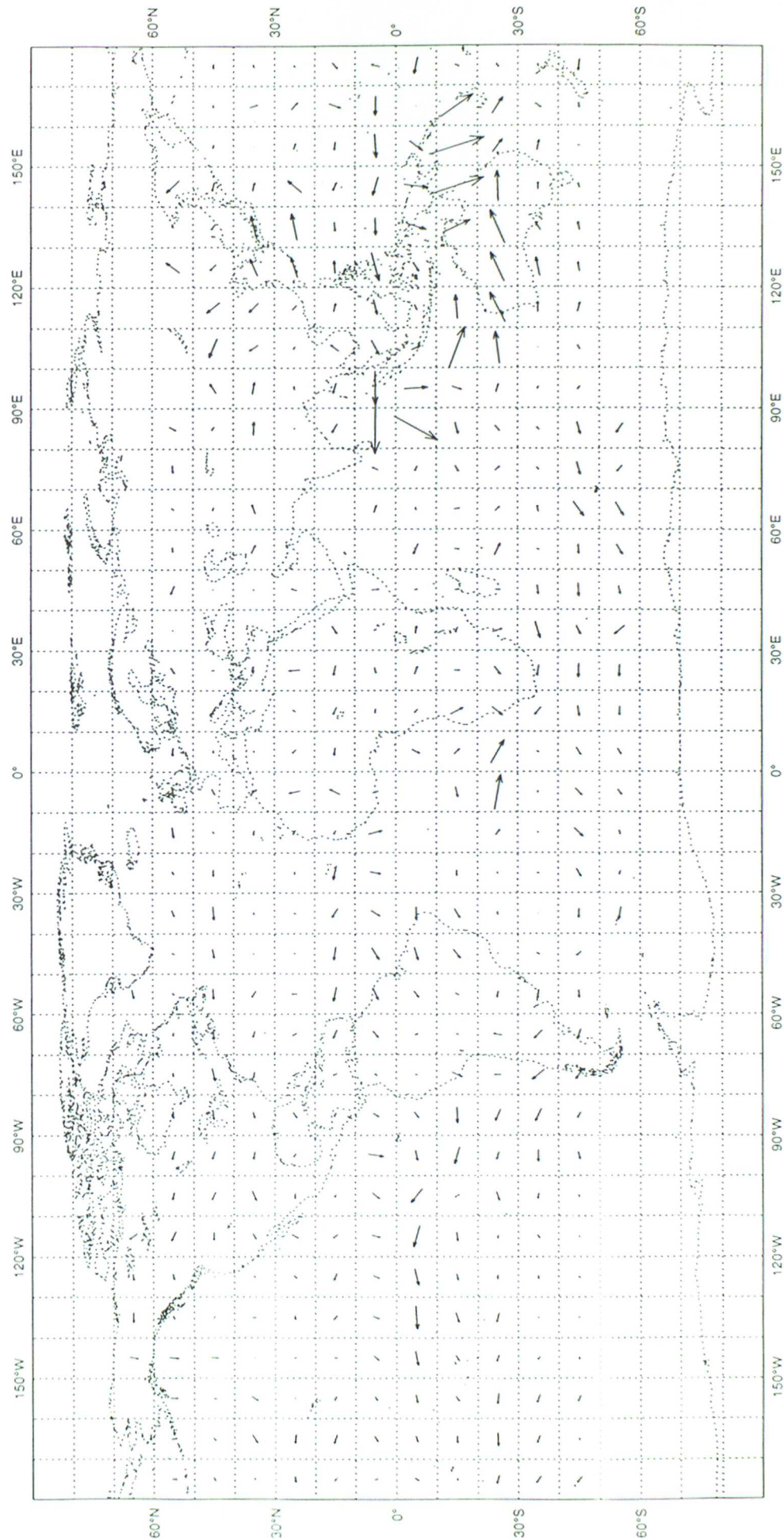
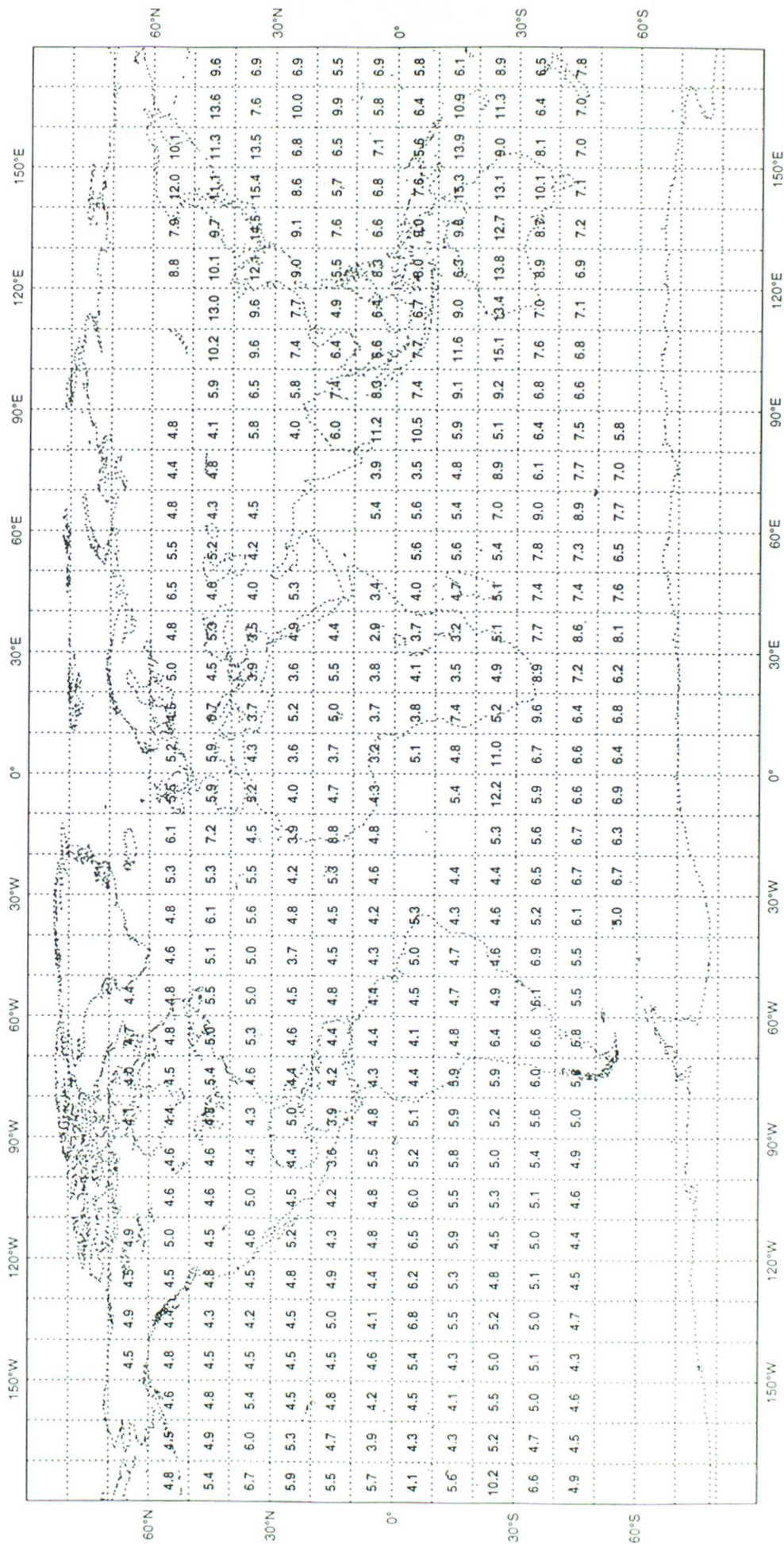


Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). OCTOBER 2002
 All observations
 Values are plotted where greater than 10 obs are present



Global average number of observations in 24 hours = 69114

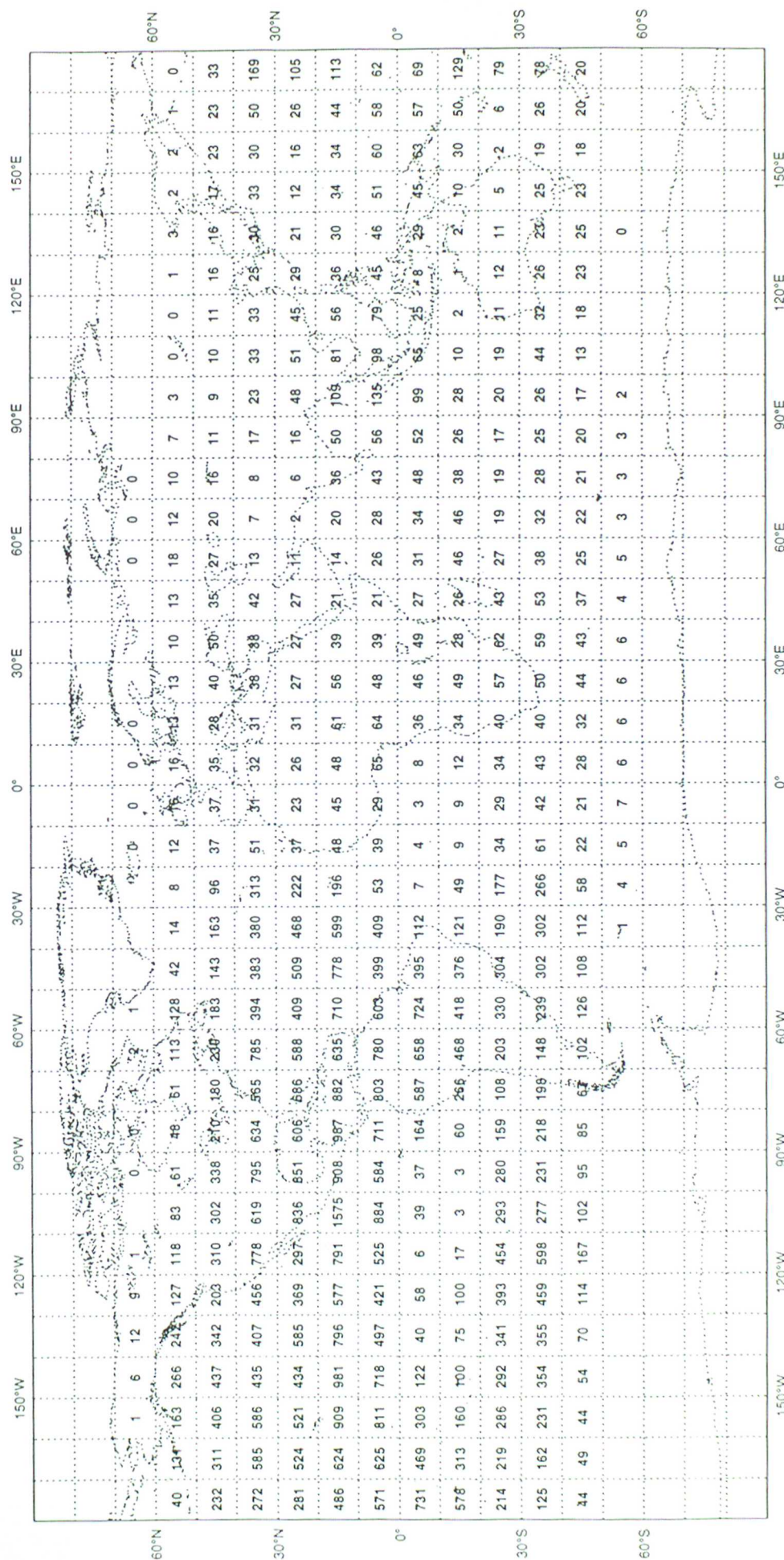


Figure 21. SATOB 101 - 400 hPa vector mean wind. OCTOBER 2002
 All observations
 Arrows are plotted where greater than 10 obs are present

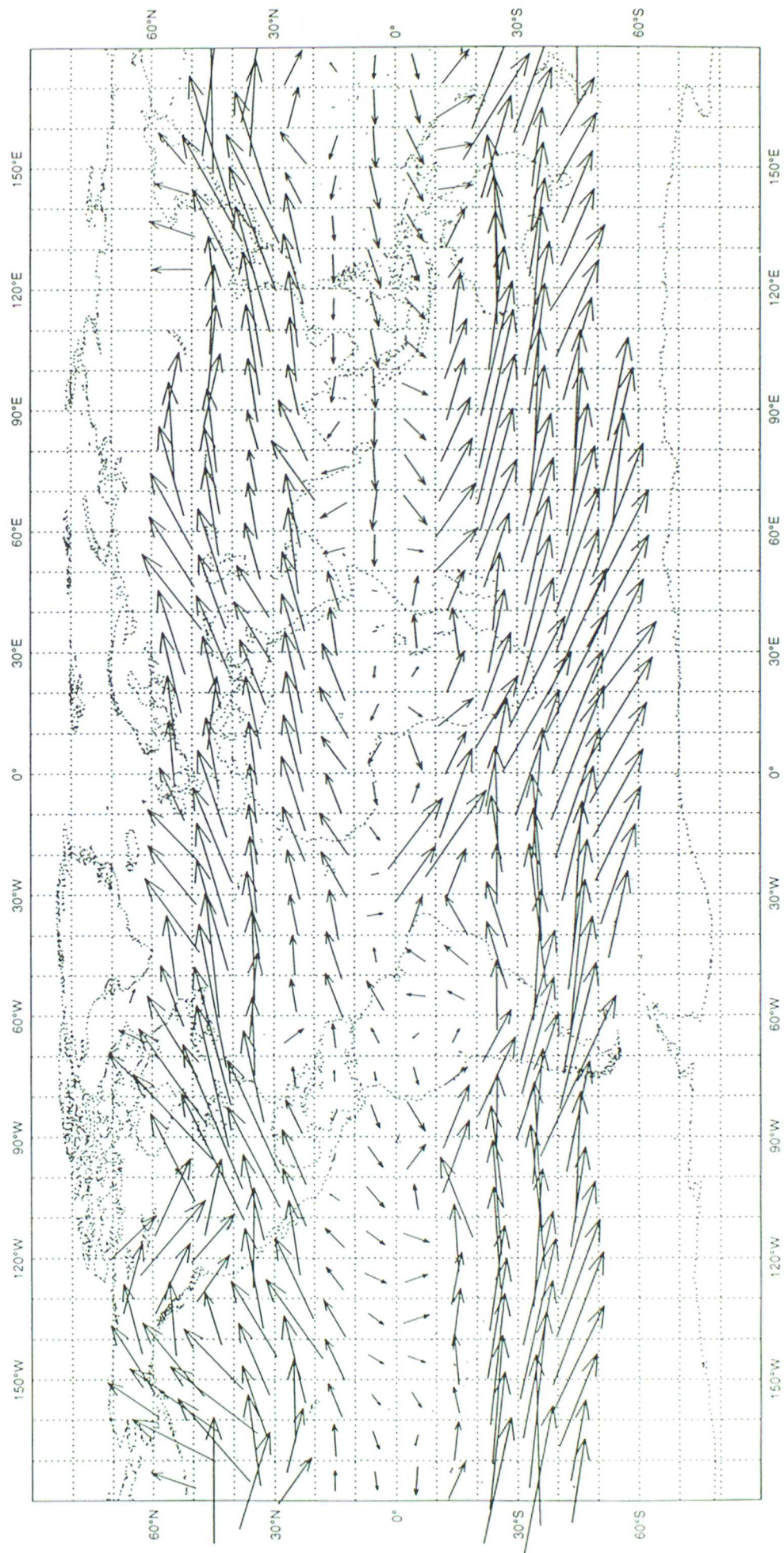


Figure 22. SATOB 101 - 400 hPa vector wind differences. OCTOBER 2002
 All observations
 Arrows are plotted where greater than 10 obs are present

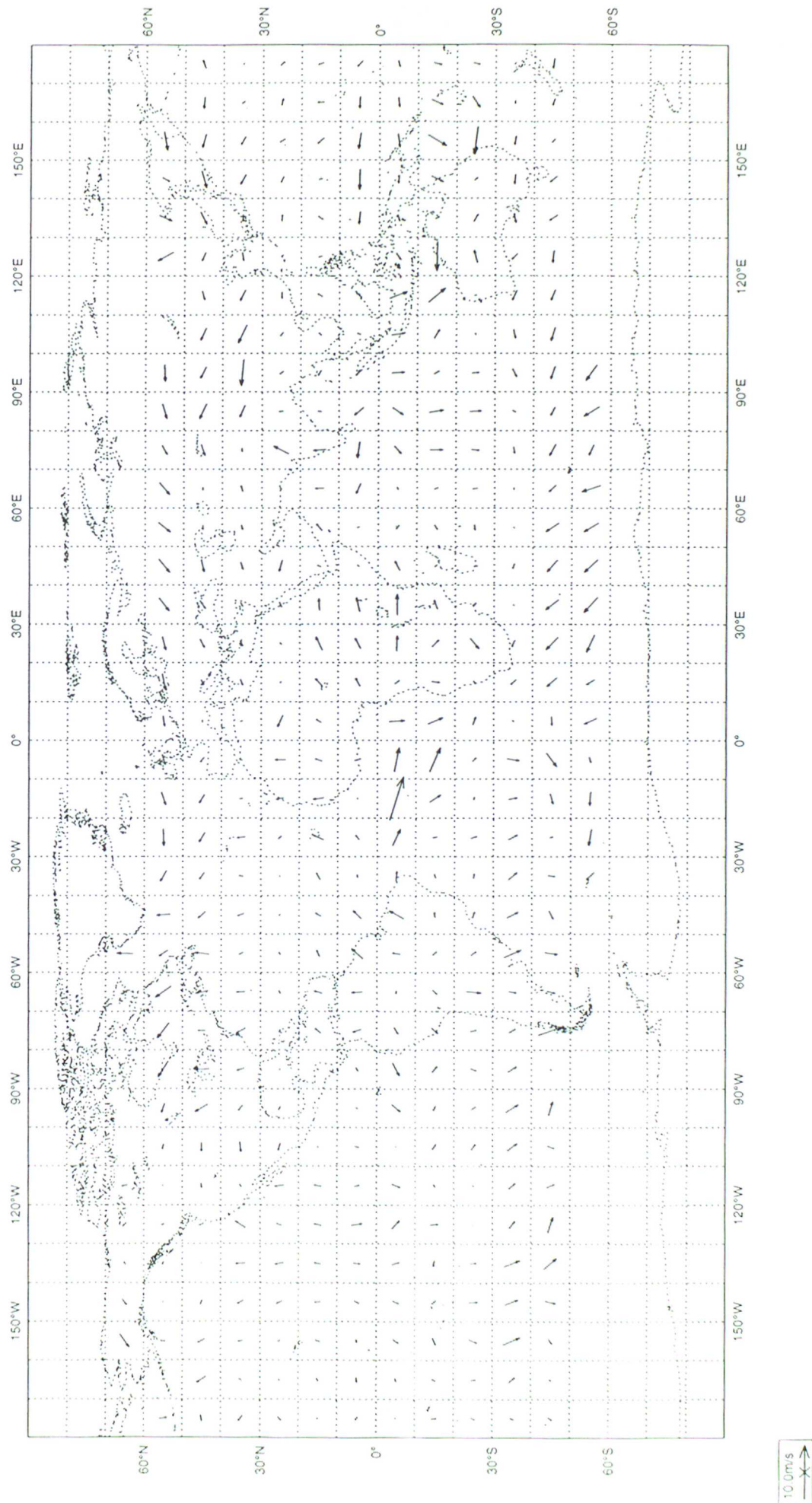
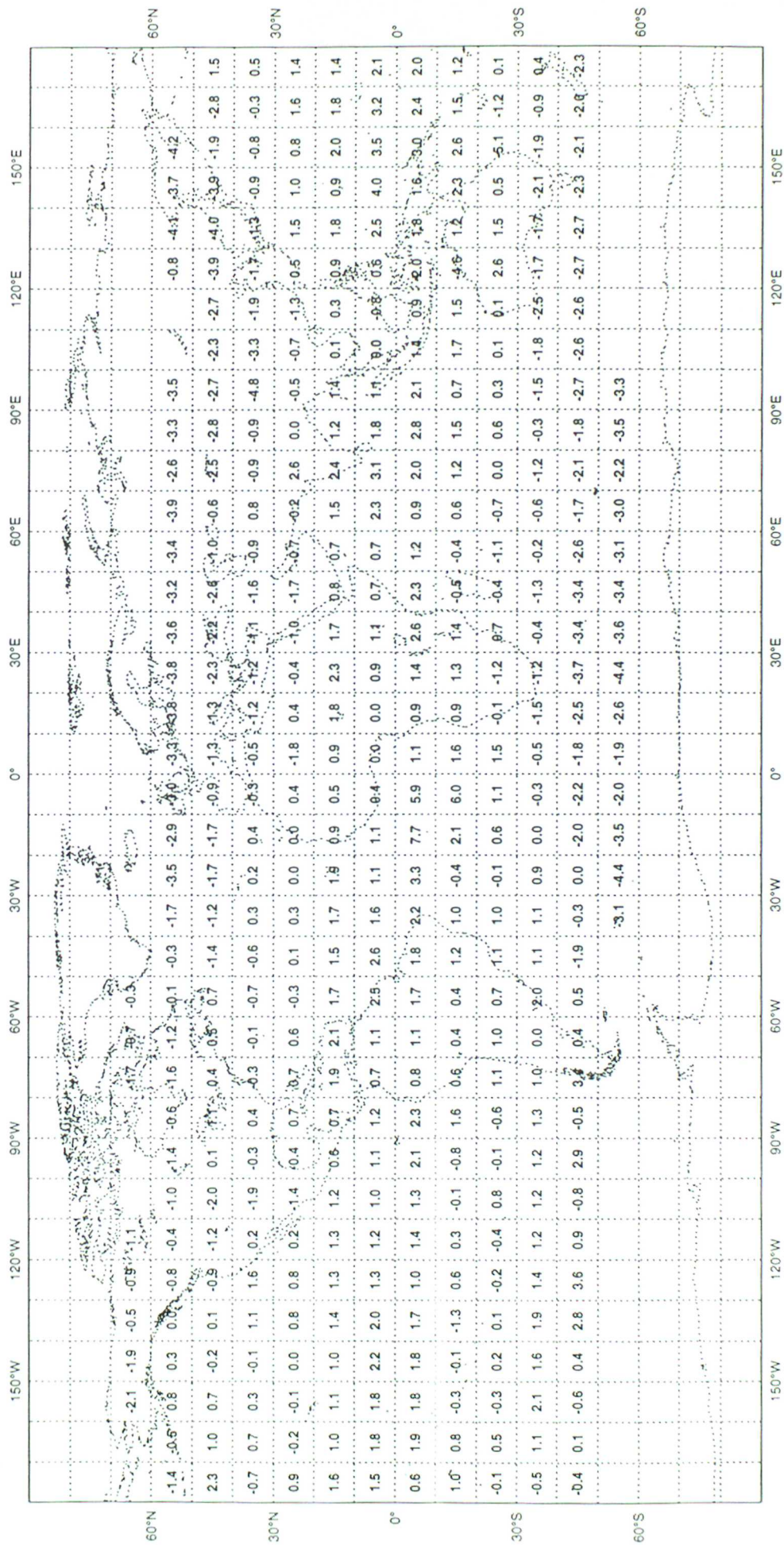


Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). OCTOBER 2002

All observations

Values are plotted where greater than 10 obs are present



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: October 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

Global average number of observations in 24 hours = 585809

509

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations

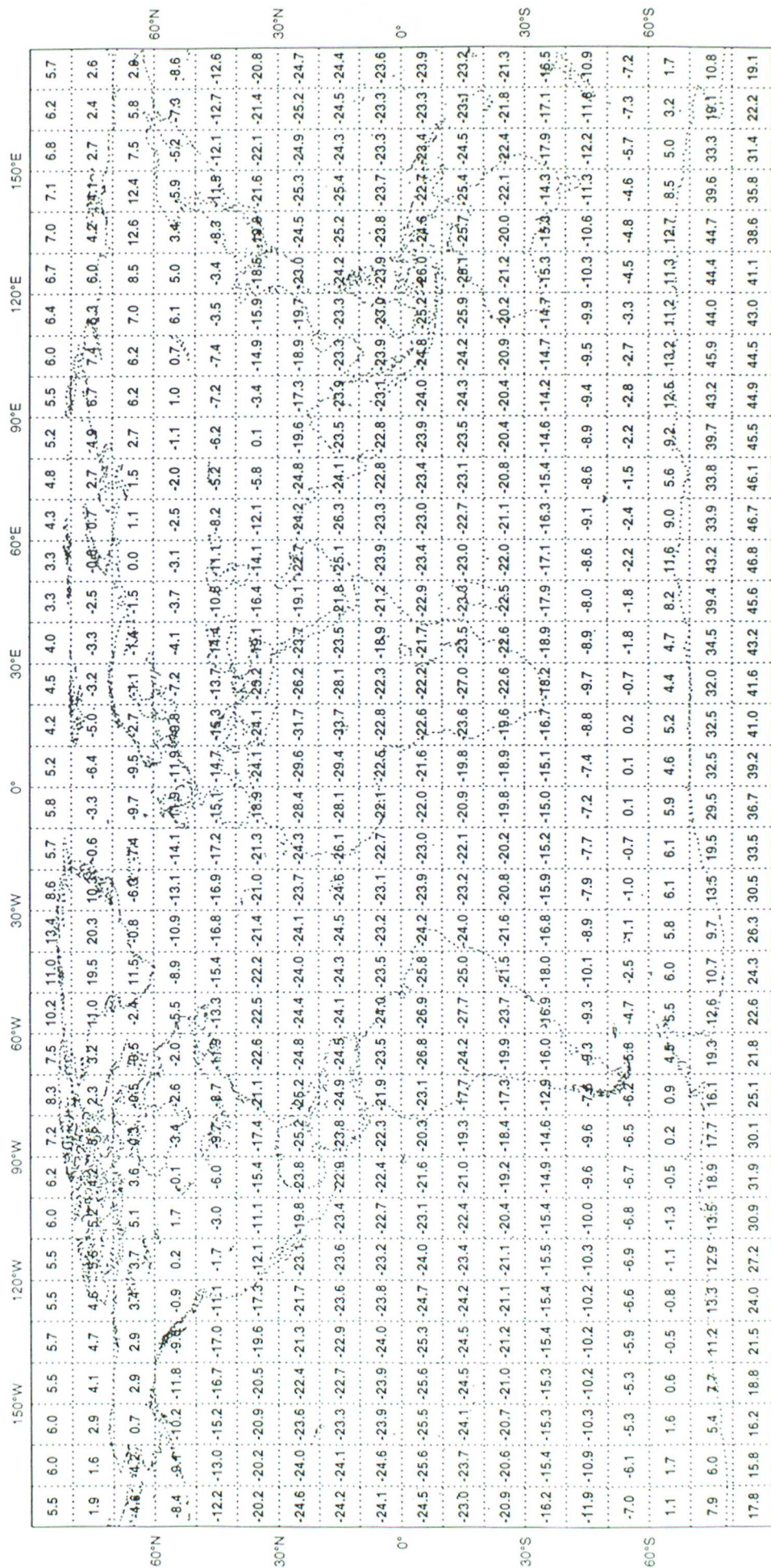
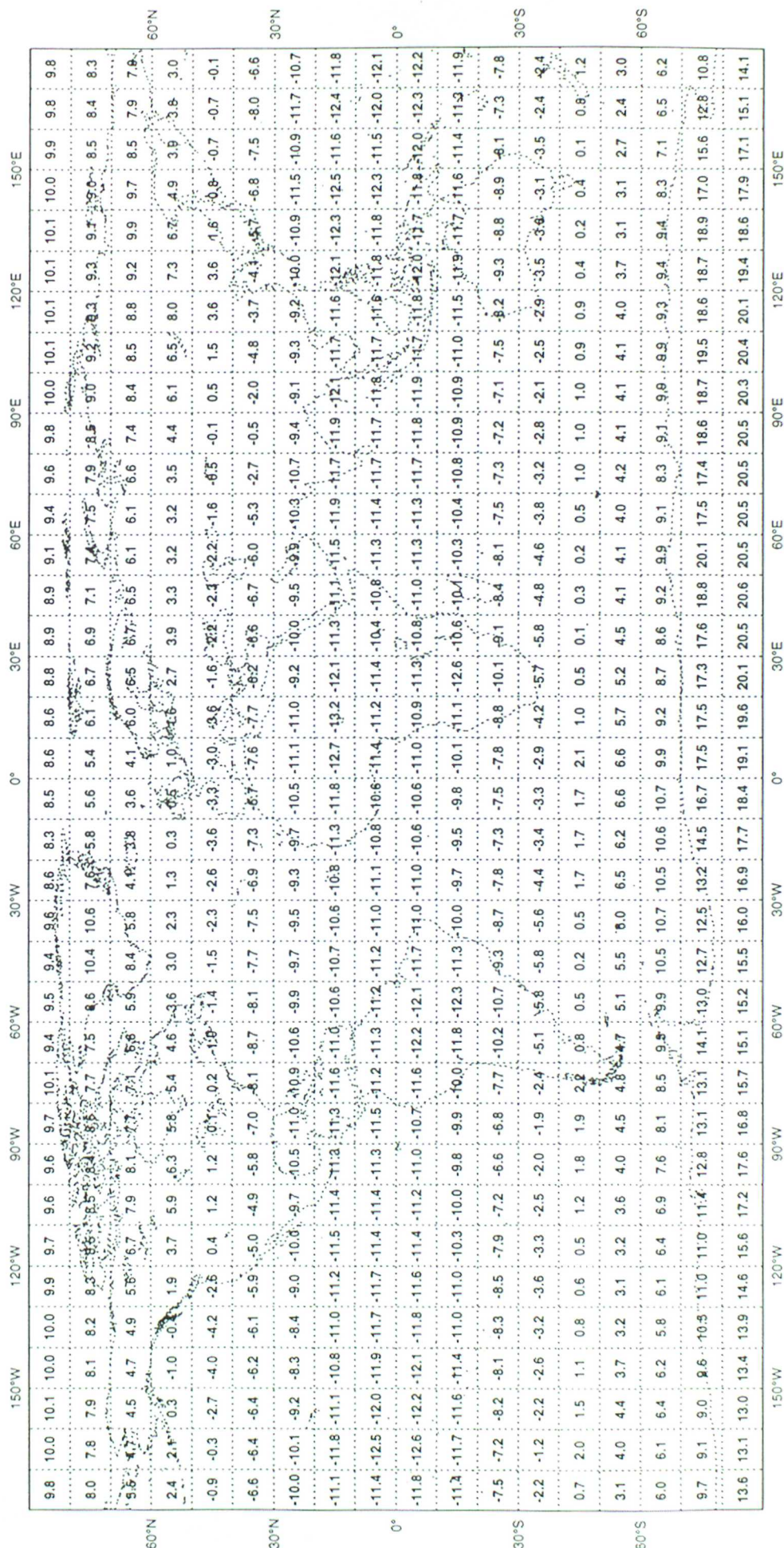
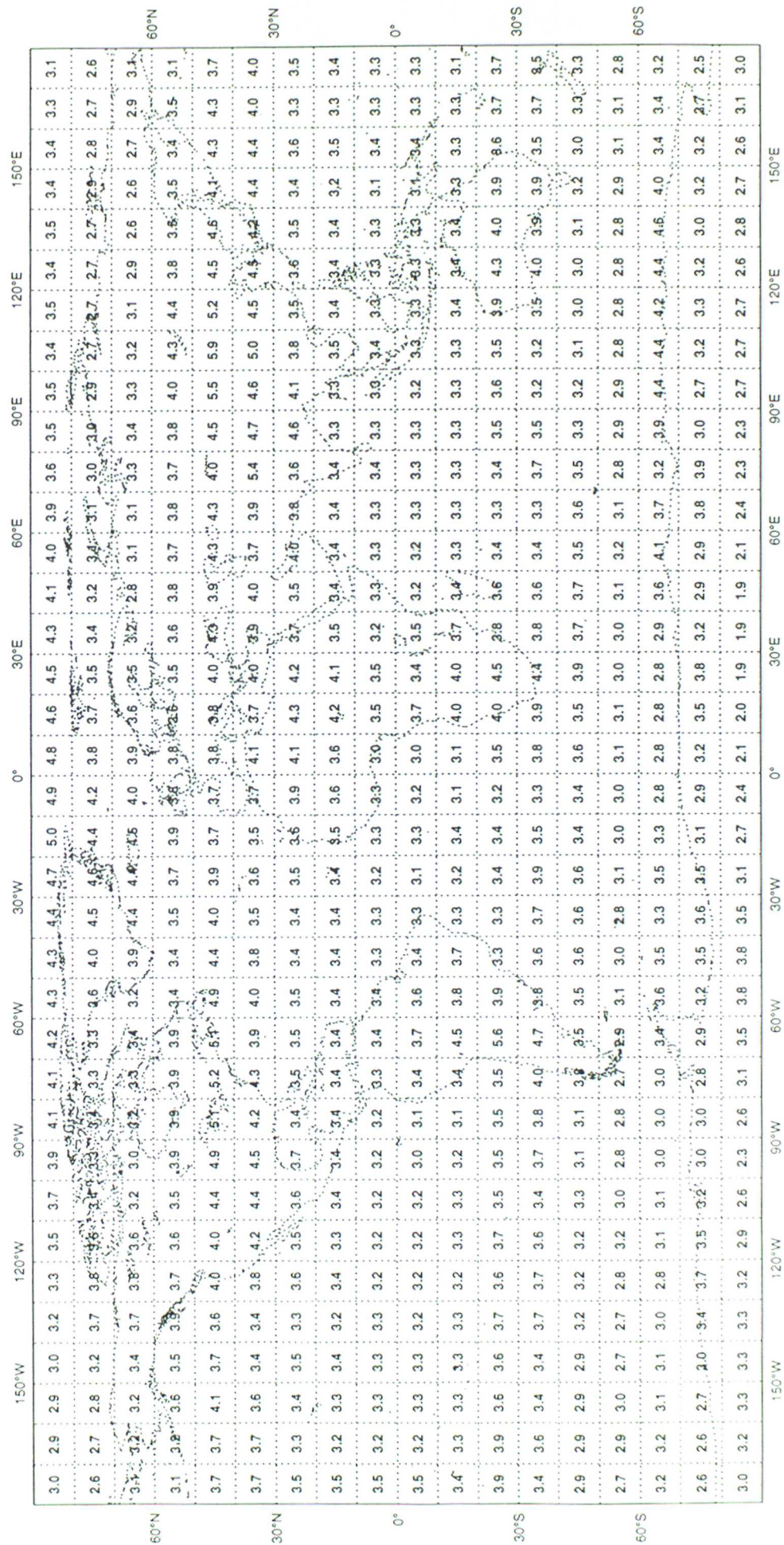


Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



NOAA15, using all observations



NOAA15, using all observations

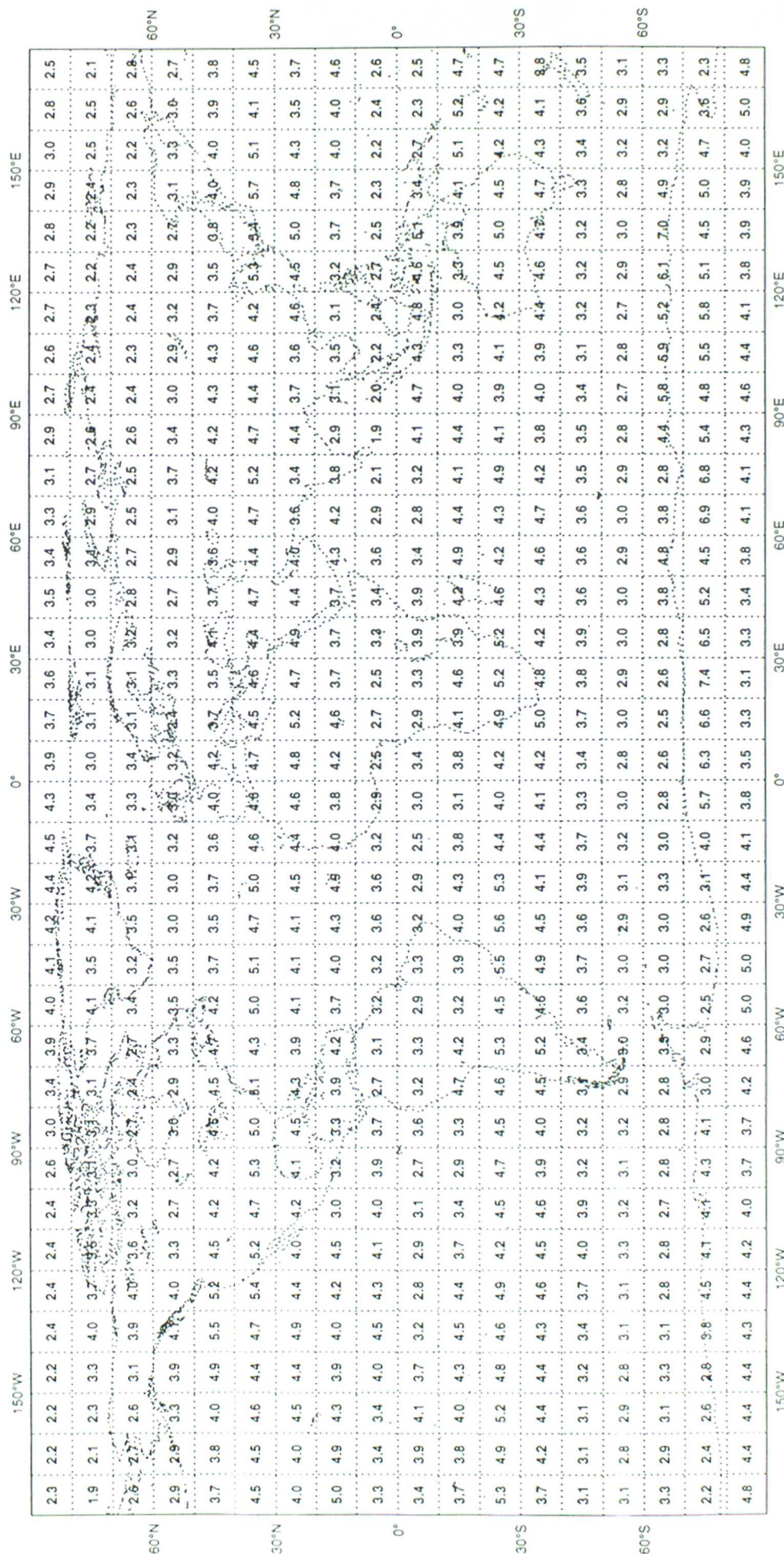


Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
 Channel: HIRS4 (400 hPa)
 NOAA15, using all observations

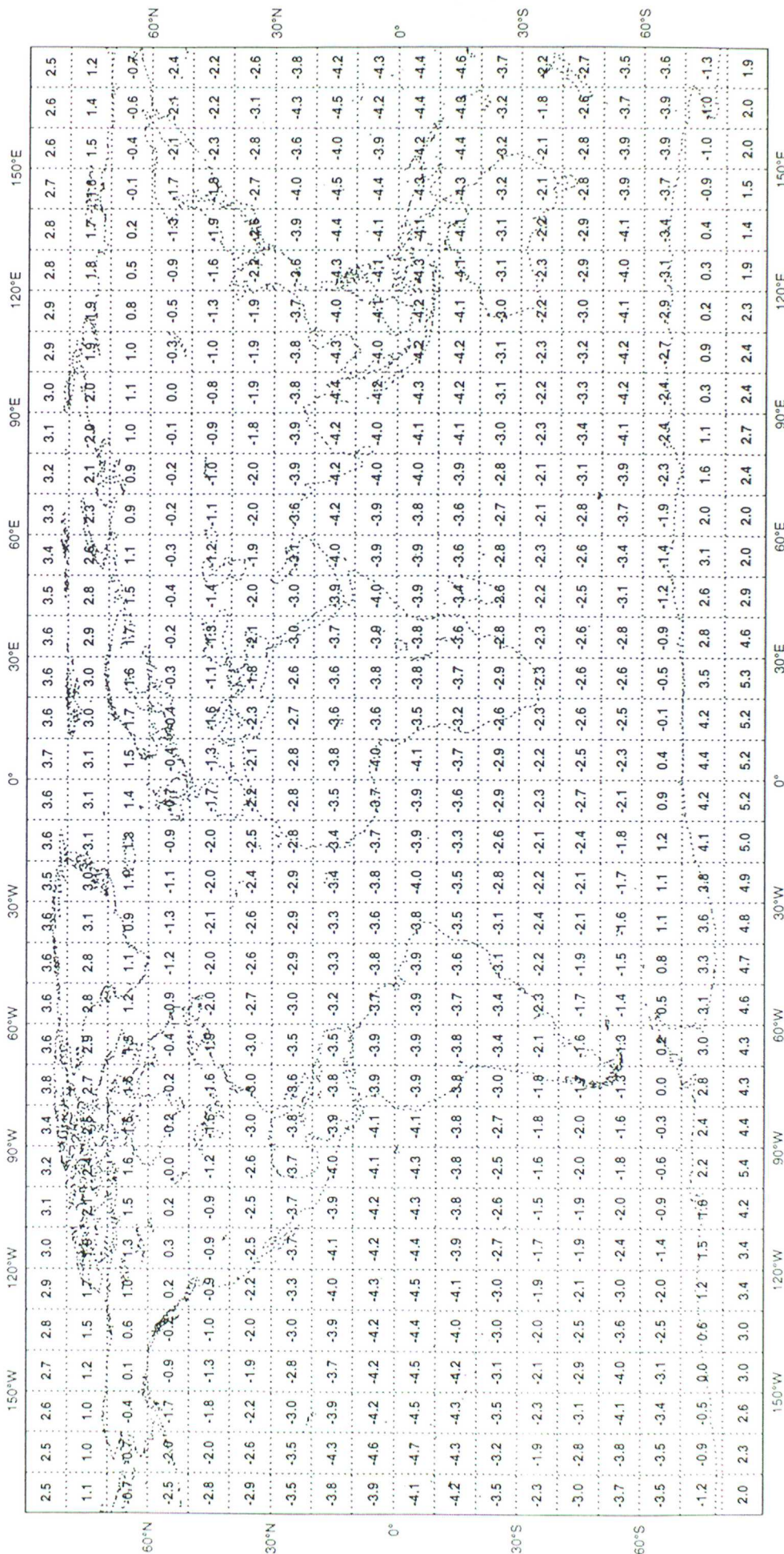


Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



Figure 35. ATOVS SD O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

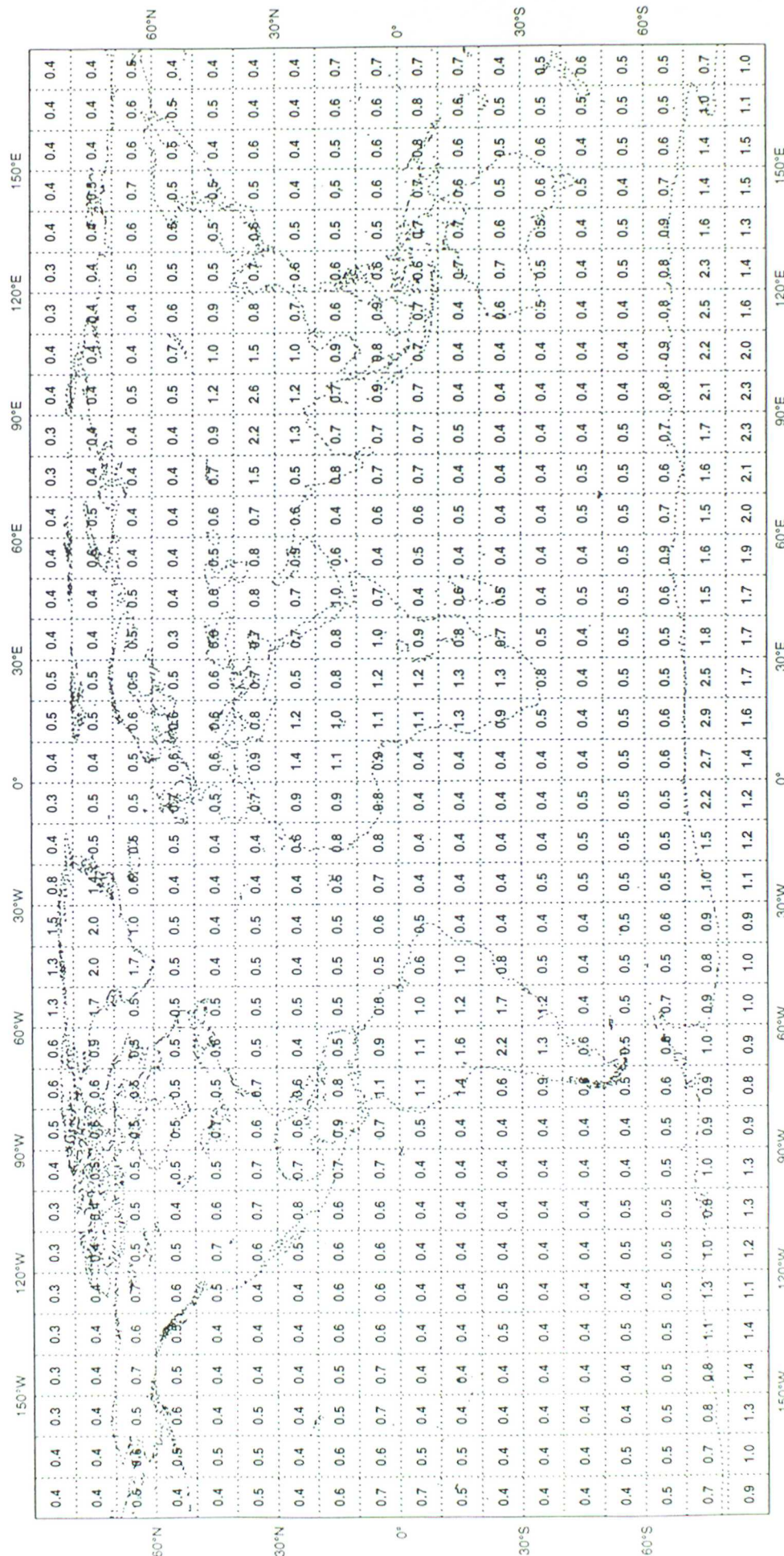


Figure 40. ATOVS mean daily count. OCTOBER 2002
NOAA16, using all observations
Global average number of observations in 24 hours = 549076

[illegible]

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

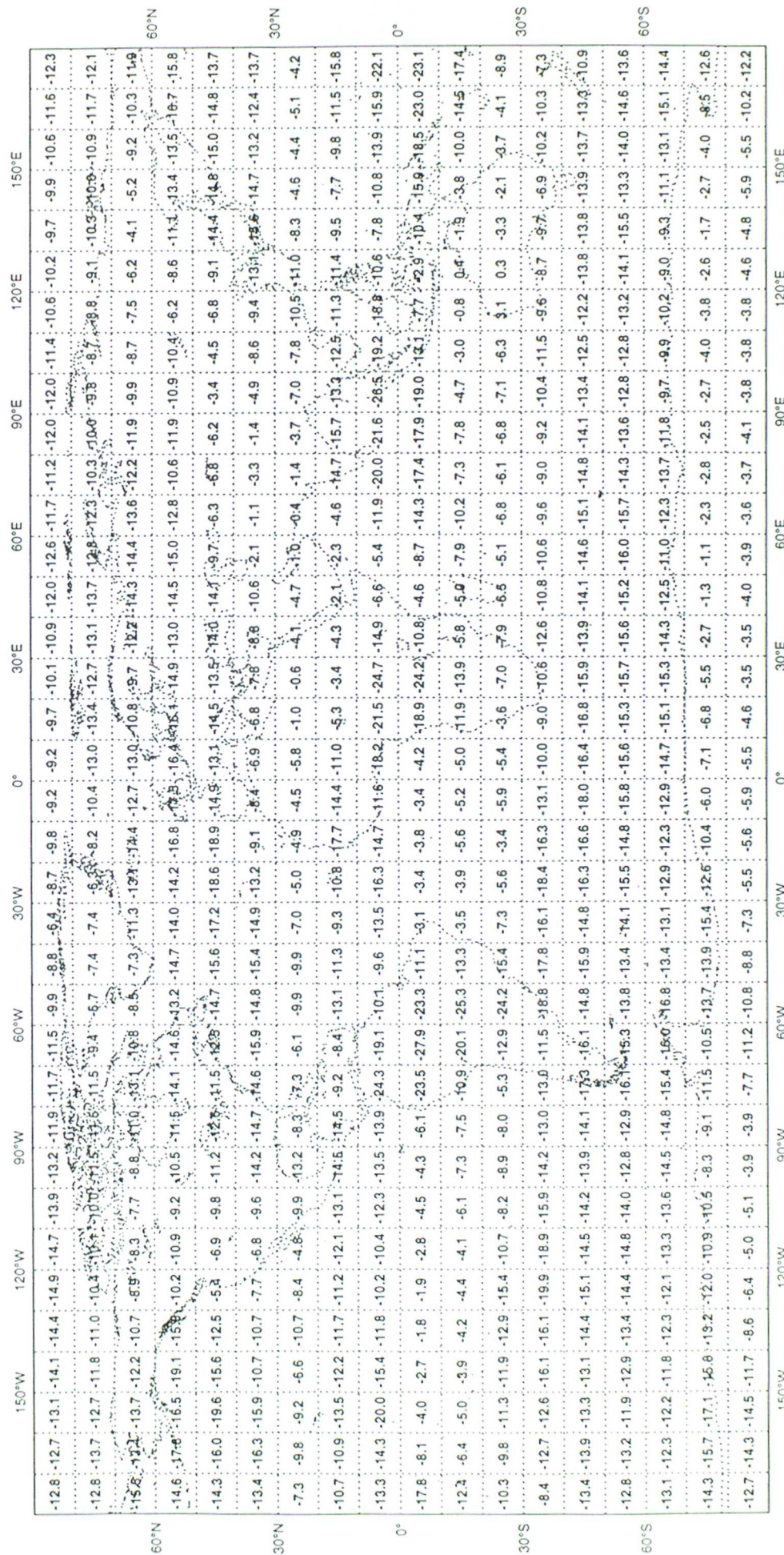
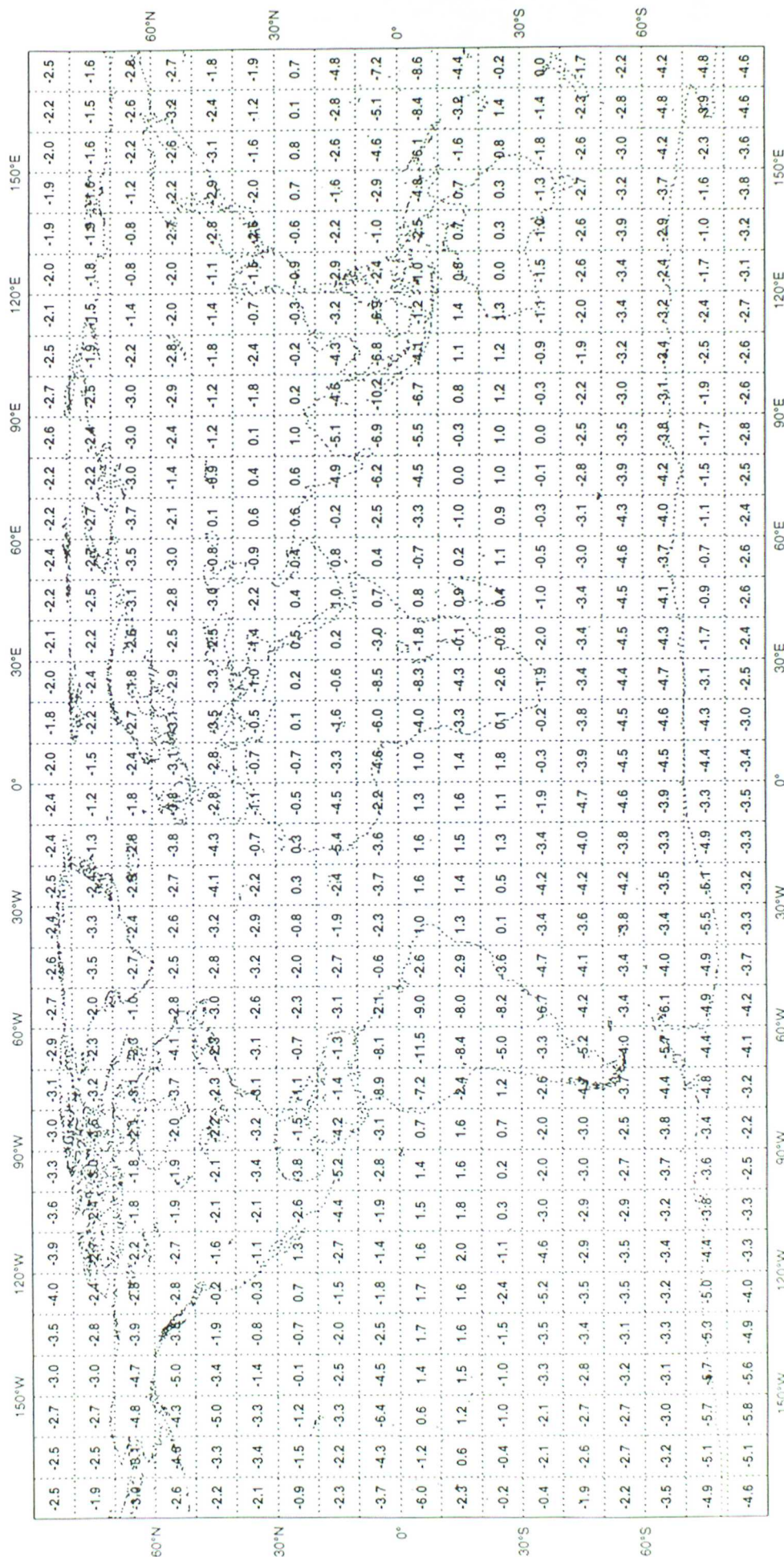


Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



NOAA16, using all observations

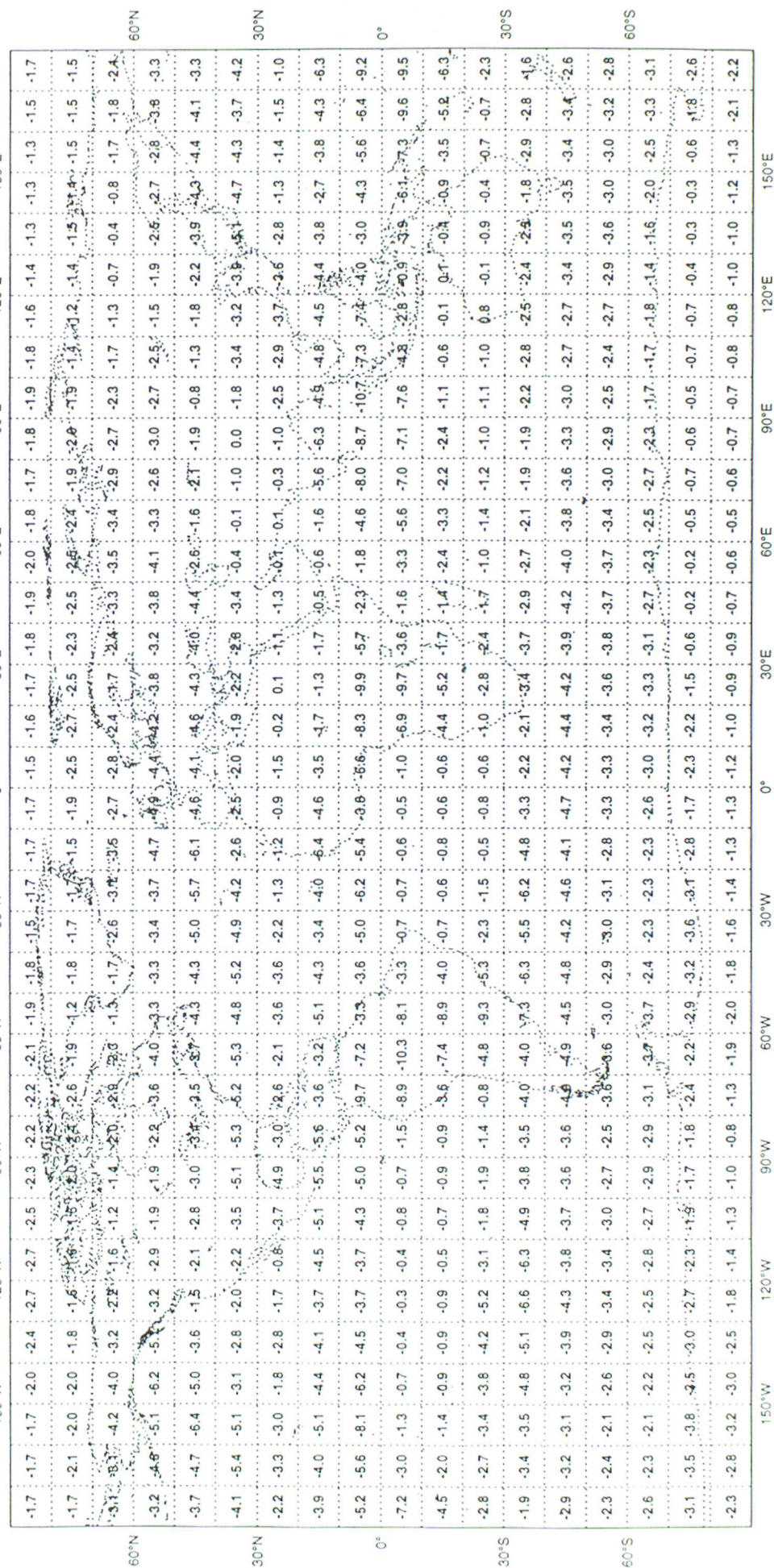


Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

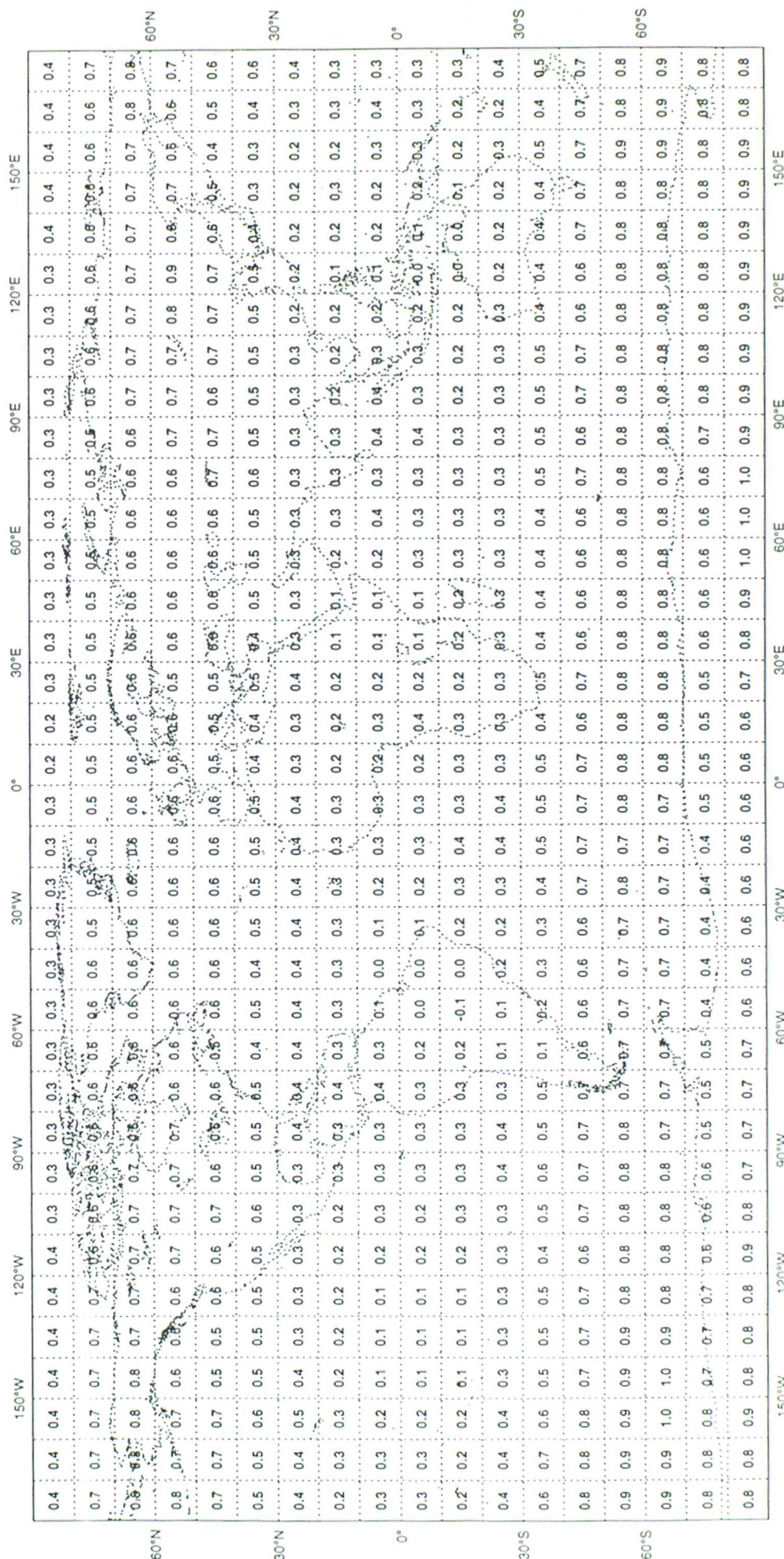


Figure 48. ATOVS SD O-B brightness temperature differences (deg C). OCTOBER 2002
 Channel: HIRS4 (400 hPa)
 NOAA16, using all observations

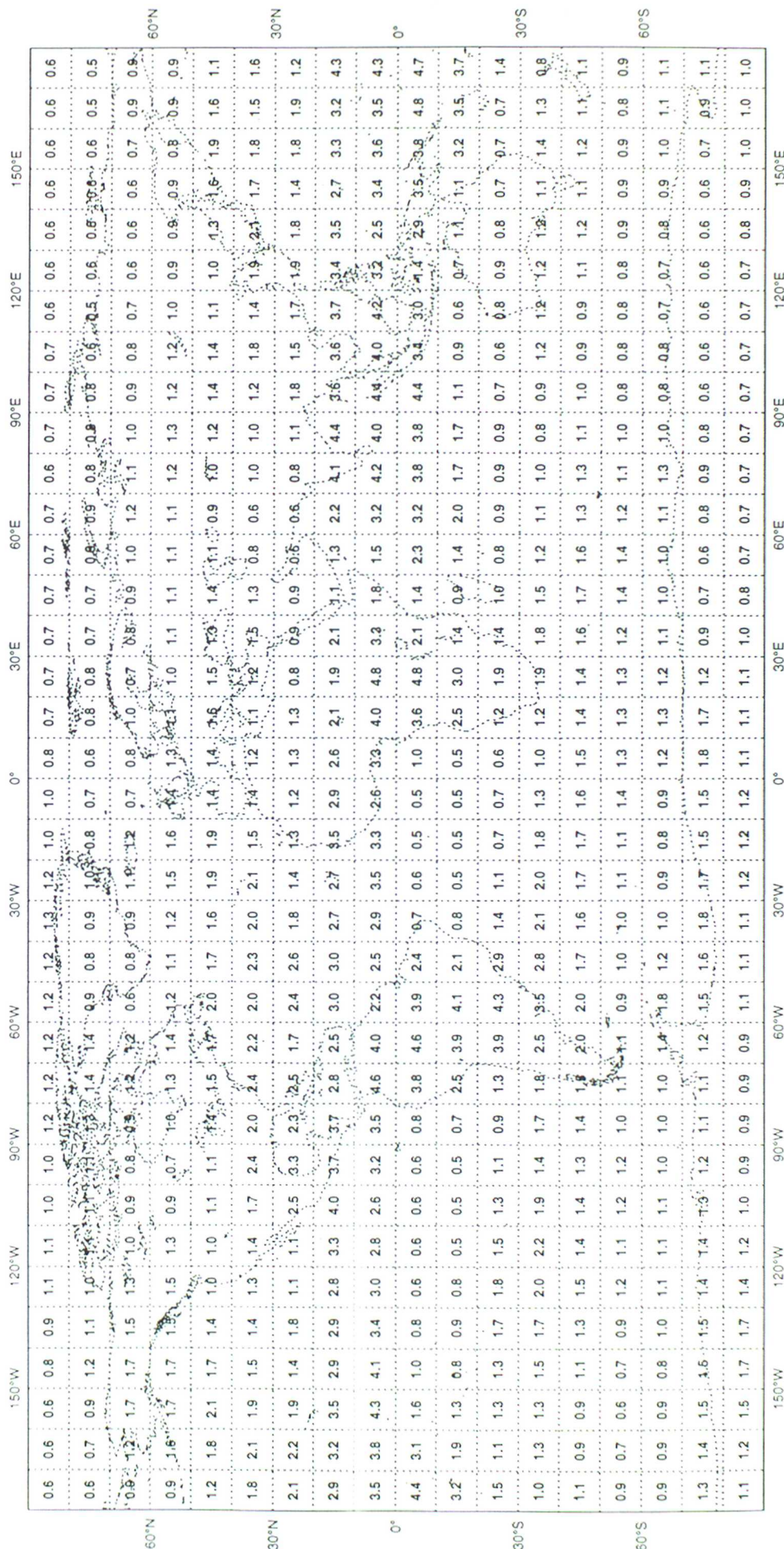


Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

	150°W	120°W	90°W	60°W	30°W	0°	30°E	60°E	90°E	120°E	150°E																									
60°N	5.4	5.2	5.5	6.0	6.8	7.6	7.3	6.6	6.5	7.4	7.7	8.3	8.9	8.5	10.0	9.3	7.0	7.2	6.5	6.5	6.5	6.3	6.8	6.8	6.3	5.5	5.8	6.2	6.0	5.5	5.6	5.3	5.1	4.8	5.2	5.7
	6.0	7.0	7.3	7.7	7.2	6.8	7.8	8.5	8.1	8.8	10.6	10.8	10.0	6.9	6.7	9.4	7.6	7.7	8.3	10.1	9.5	9.0	9.3	9.6	8.7	7.2	7.9	6.8	5.8	6.3	5.7	5.9	5.7	5.7	5.5	5.1
	9.3	11.2	13.4	13.1	11.9	9.9	8.4	6.7	7.3	8.3	10.1	10.2	9.3	10.6	12.1	12.2	12.3	10.7	12.4	11.9	8.7	9.8	10.1	9.9	10.7	8.9	8.2	8.3	7.1	6.4	5.7	5.8	6.3	7.9	8.8	9.2
60°N	11.4	14.4	15.3	16.7	14.2	12.9	11.2	9.6	9.0	9.6	11.6	12.7	12.1	12.2	13.2	14.2	16.2	14.6	13.6	13.1	11.9	10.6	11.1	11.2	11.1	10.5	11.4	11.6	10.6	10.2	9.2	10.3	10.7	10.7	11.9	11.1
	12.5	15.5	18.4	17.3	14.3	10.0	11.4	11.6	12.1	13.0	13.3	13.8	16.0	15.4	16.5	17.9	18.0	15.5	15.1	16.0	15.5	14.9	12.5	10.9	12.2	13.4	14.0	12.7	11.5	11.9	15.5	15.8	15.8	13.4	11.9	
	15.1	18.5	18.7	15.0	12.8	11.1	13.1	15.2	17.7	17.2	18.2	18.1	18.9	18.0	16.8	12.9	14.1	14.6	13.6	13.8	16.5	16.7	11.6	6.9	10.4	11.1	12.6	15.9	15.4	17.3	18.1	17.0	16.6	14.2	15.2	
30°N	13.1	15.2	15.1	10.8	12.4	8.3	7.6	15.6	18.6	15.2	14.5	12.8	17.9	17.3	12.7	9.3	10.3	13.3	16.9	15.5	10.5	11.2	11.2	6.1	4.8	5.7	9.7	11.8	12.2	13.6	14.8	13.6	9.6	10.3	10.2	7.2
	16.8	17.2	18.8	16.5	16.3	16.1	18.7	20.3	19.4	19.8	16.4	15.5	19.6	18.6	16.5	17.4	21.5	19.0	18.2	14.9	14.7	14.7	9.1	7.7	11.7	20.8	22.3	18.2	18.2	18.8	18.1	17.4	14.2	17.1	17.8	22.0
	19.8	20.8	24.0	22.5	19.5	17.2	16.3	16.1	18.5	19.2	22.9	21.2	13.8	16.1	19.0	21.0	19.5	16.0	20.4	21.2	24.1	18.5	12.6	10.8	18.8	22.4	22.5	23.6	21.6	21.7	17.2	14.6	18.1	19.8	19.9	22.9
0°	22.8	15.6	8.1	5.2	3.7	3.1	3.4	3.7	3.2	6.9	20.7	23.8	21.1	14.9	4.8	4.0	3.1	3.4	6.9	20.2	23.7	13.9	9.8	15.1	19.6	21.7	21.7	22.9	17.7	15.3	16.4	19.3	21.2	25.2	24.4	
	17.2	11.6	9.0	7.7	7.8	7.3	4.5	4.1	3.6	3.9	15.8	22.2	15.2	5.6	4.5	4.2	3.9	4.0	19.0	19.9	11.6	9.3	11.3	12.8	11.1	11.8	6.4	4.8	3.5	8.3	7.6	6.7	16.0	17.5	19.0	
	13.2	13.4	14.2	14.8	17.0	18.0	13.9	9.7	10.3	8.7	7.9	23.9	25.0	18.8	13.7	10.5	6.1	6.0	5.0	14.1	19.3	14.5	11.1	7.9	8.7	8.4	7.1	7.0	7.2	11.4	14.4	11.1	7.9	7.3	7.1	12.4
30°S	11.2	14.6	14.8	16.4	16.9	18.8	17.9	15.6	15.0	14.5	15.6	21.0	23.5	19.6	17.5	17.3	16.3	13.7	11.2	12.5	16.7	15.6	13.6	12.0	10.9	10.0	9.4	10.2	12.0	13.1	14.5	14.2	15.2	15.4	14.4	10.8
	11.9	12.5	12.6	13.4	14.3	14.6	13.2	13.0	13.1	13.5	15.8	18.8	16.9	16.0	15.0	14.9	13.9	13.9	13.0	12.8	12.9	13.6	14.3	13.2	12.7	11.7	11.0	11.2	10.8	11.0	12.6	13.3	13.2	13.8	12.8	11.9
	8.8	9.0	8.8	10.3	10.9	12.2	11.7	10.8	10.4	9.5	11.4	12.8	11.7	10.5	10.3	10.1	9.8	9.9	10.3	10.4	10.4	10.5	11.0	11.3	10.1	10.1	9.5	9.5	9.3	9.4	10.1	10.7	10.0	9.7	9.6	8.7
60°S	8.3	7.6	7.1	7.7	9.6	9.2	9.3	8.2	8.1	8.1	8.5	11.4	11.5	7.6	7.0	7.2	6.8	7.8	8.4	8.6	8.8	8.9	10.4	10.7	10.1	9.4	9.0	8.6	8.2	8.2	8.3	9.7	9.6	8.7	9.1	8.9
	8.5	8.0	8.3	10.2	10.8	10.1	9.5	8.5	8.2	8.0	9.0	9.6	10.0	10.5	10.5	10.7	10.6	9.2	9.8	8.8	7.7	5.8	3.8	3.5	5.3	5.8	3.7	3.4	3.4	3.6	3.5	3.3	4.1	5.6	8.7	8.4
	7.8	8.7	10.4	11.3	11.0	9.4	8.1	7.0	5.7	5.1	6.6	8.3	9.8	9.3	7.7	6.1	5.8	5.5	4.8	4.7	4.5	4.1	3.6	3.2	3.3	3.6	3.7	3.8	3.6	3.3	3.7	4.5	5.6	7.5	8.5	7.7

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

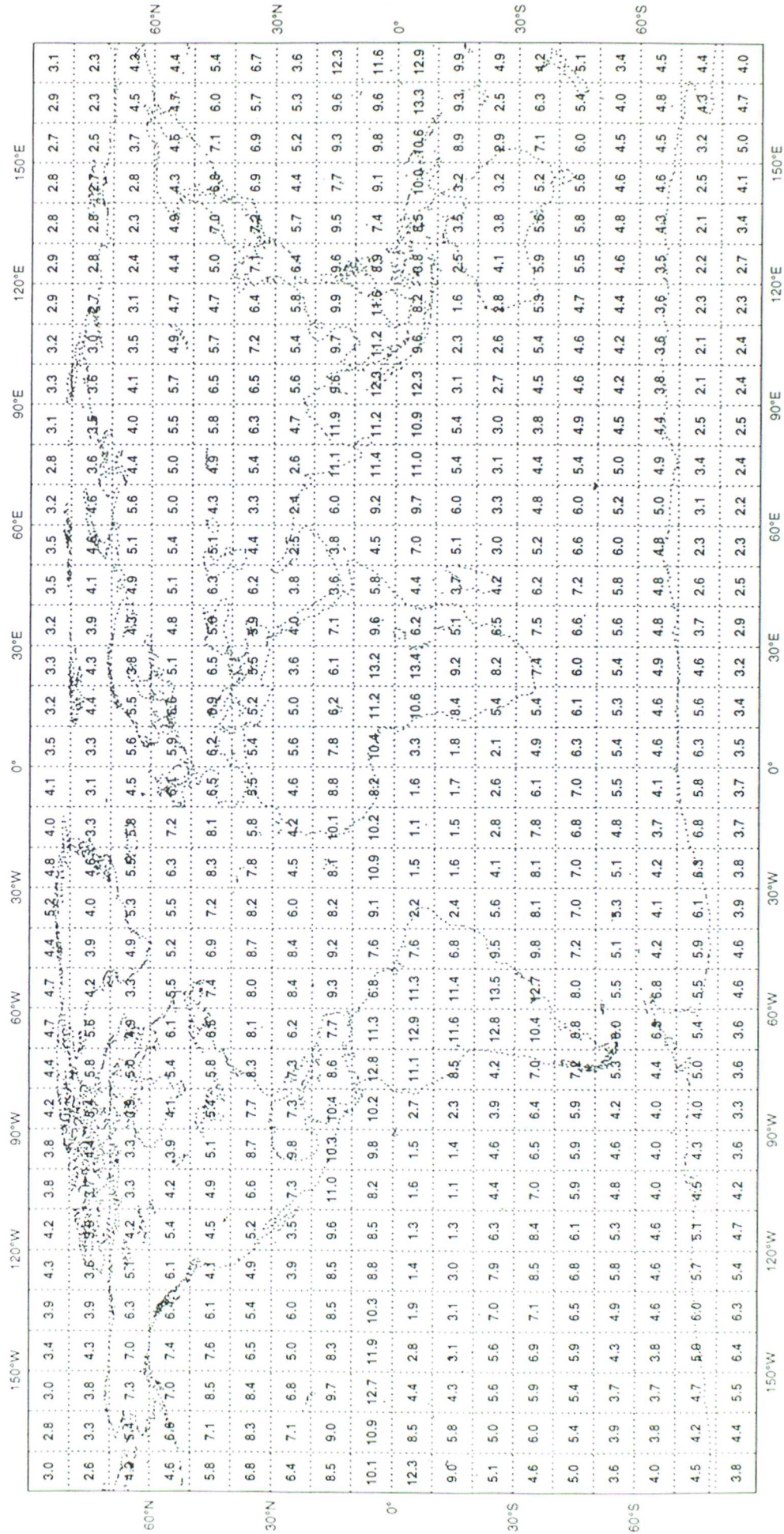


Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

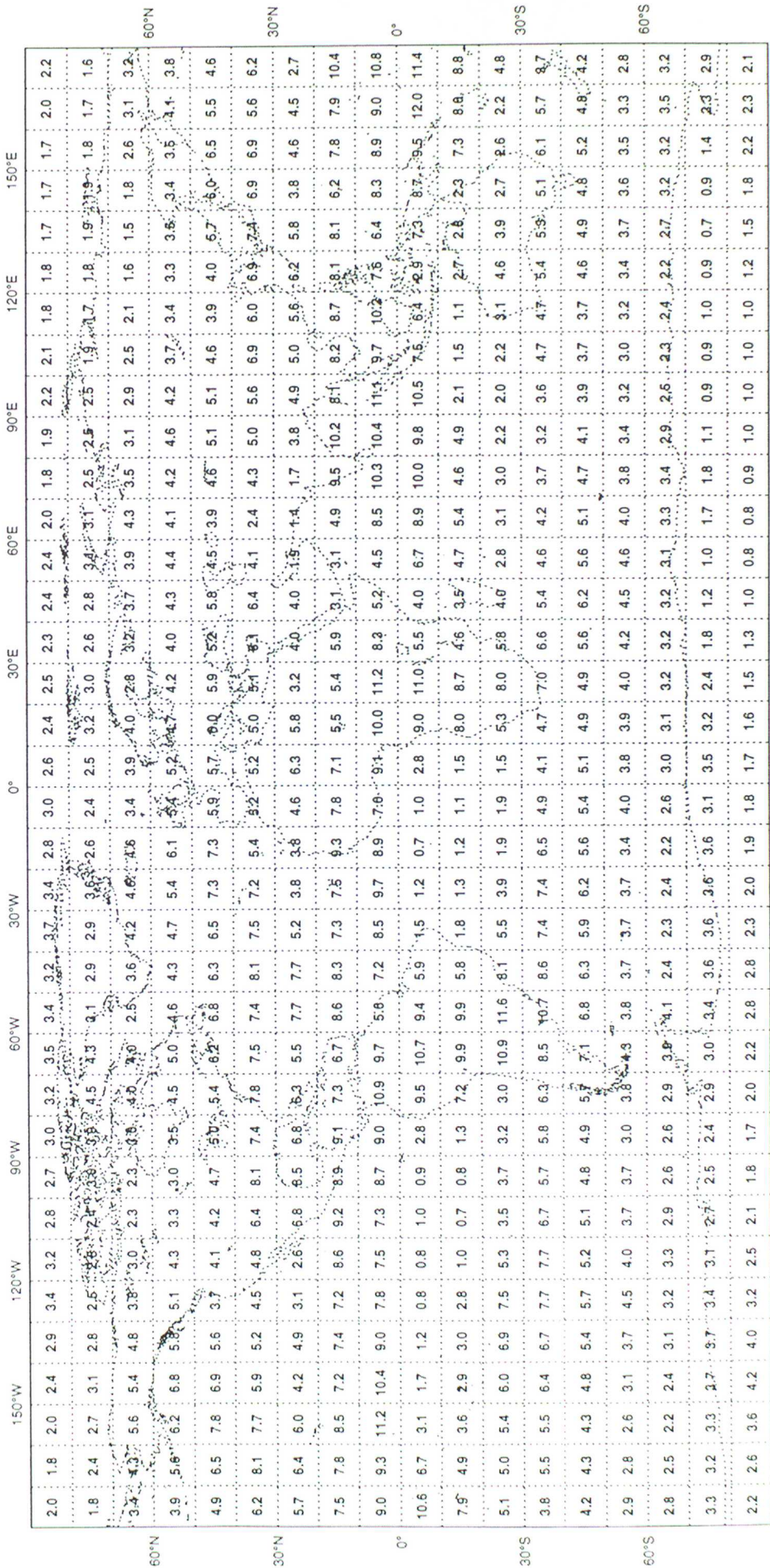


Figure 54. ATOVS SD O-B brightness temperature differences (deg C). OCTOBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

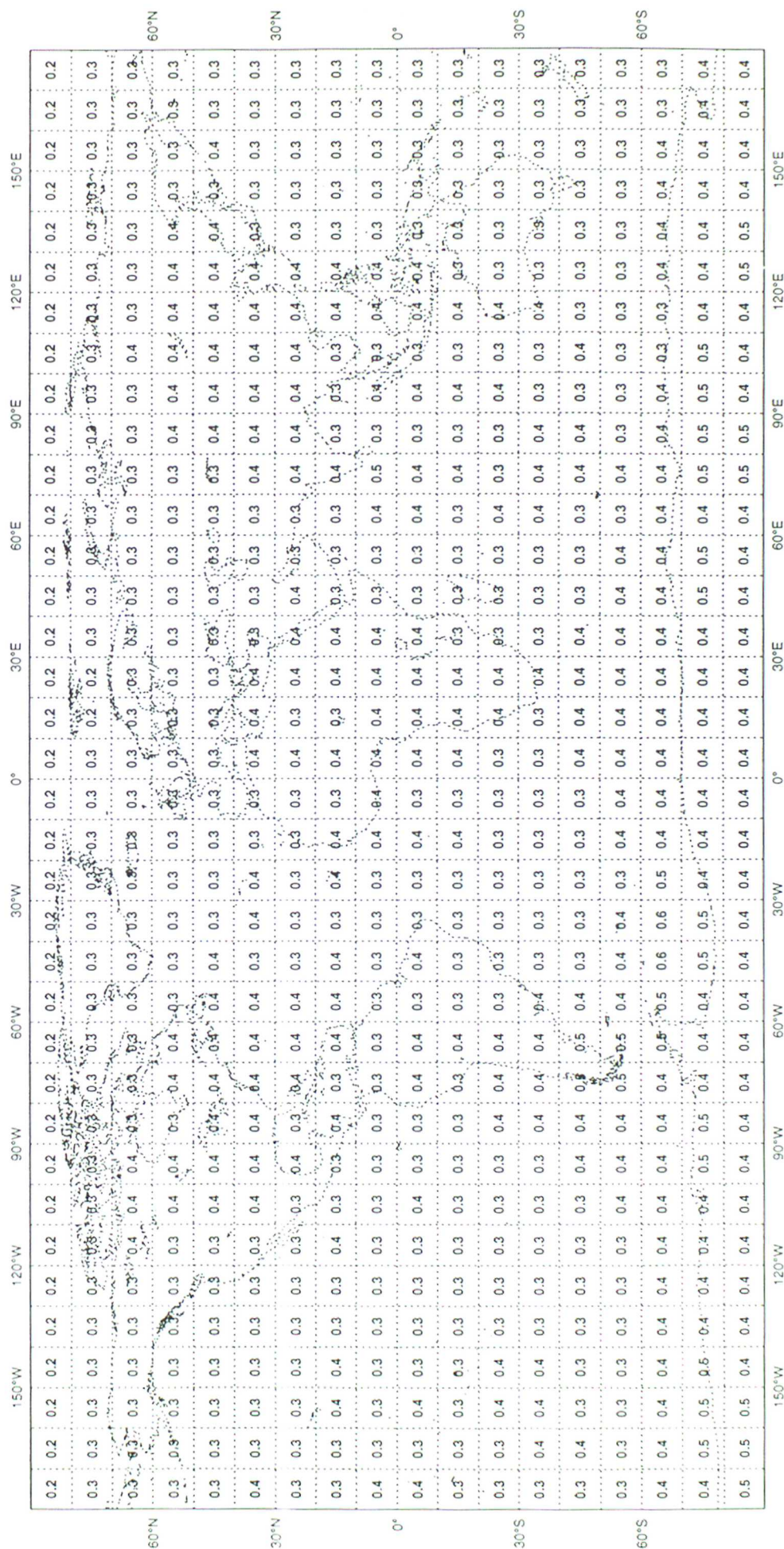


TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
 DATA TYPE:- DRIFTER
 MONITORING CENTRE: BRACKNELL
 MONTH: October 2002

Monitoring procedures	
Period	:One calendar month.
Data monitored	:Reports from each unique identifier for drifting buoy.
Area monitored	:10°N - 80°N, 85°W - 0°W
Standard of comparison	:Background field from UKMO global model.
Position	:Average latitude and longitude for period.
Observation times	:All hours combined.
Elements monitored	:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored	
	:NOBS :Number of observations received excluding duplicates.
	:NGE :Number of observations with gross errors.
	:PGE :Percentage of observations with gross errors.
	:SD :SD of difference of observations from background values excluding those with gross errors.
	:BIAS :Mean difference of observations from background values excluding those with gross errors. N.B. A positive bias indicates the wind observation is veered to the background
	:RMS :Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
135600	35.8	-9.6	P	1	0	0	0.0	0.1	0.1
41503	21.4	-48.1	P	600	0	0	0.5	-0.1	0.5
41522	17.7	-46.1	P	598	0	0	0.5	0.3	0.6
41523	26.7	-46.0	P	187	0	37	0.6	0.7	0.9
41531	27.1	-73.5	P	615	0	0	0.6	0.9	1.1
41532	23.4	-70.1	P	623	0	0	0.5	0.7	0.9
41533	27.0	-76.0	P	618	0	0	0.6	-0.1	0.6
41534	23.4	-70.4	P	621	0	0	0.5	0.8	1.0
41536	20.1	-68.4	P	599	0	0	0.5	0.9	1.1
41537	26.8	-71.4	P	624	0	0	0.6	0.8	1.0
41557	25.7	-77.2	P	500	0	0	0.6	-0.2	0.6
41559	30.3	-75.0	P	165	0	0	0.8	0.1	0.8
41561	20.1	-67.2	P	435	0	0	0.5	-1.0	1.1
41563	20.6	-54.3	P	523	0	0	0.6	-0.6	0.8
41577	34.8	-76.2	P	630	0	0	0.7	0.6	0.9
41640	41.5	-43.9	P	648	0	0	0.9	1.4	1.7
41645	25.3	-73.3	P	797	0	25	0.5	-0.2	0.6
41647	26.1	-68.4	P	757	0	22	0.7	-0.2	0.7
41648	24.9	-70.4	P	610	0	0	0.6	0.0	0.6
41649	10.3	-51.3	P	575	0	0	0.5	-1.1	1.2
41650	28.1	-65.7	P	628	0	0	0.8	0.4	0.9
41652	29.1	-65.3	P	616	0	0	0.8	0.1	0.8
41658	37.1	-53.0	P	643	0	2	1.4	-0.9	1.6
41659	35.1	-28.9	P	629	0	0	0.6	0.5	0.8
41666	34.4	-49.7	P	645	0	0	0.6	0.2	0.6
41667	27.6	-75.7	P	301	0	1	0.9	-0.3	0.9
44504	50.6	-40.9	P	522	17	71	7.1	-2.3	7.5
44511	42.0	-39.8	P	362	1	11	0.8	-0.6	1.0
44549	57.5	-20.9	P	1672	0	57	0.6	-0.7	1.0
44550	56.4	-17.7	P	1756	0	60	0.9	-0.2	0.9
44601	38.0	-41.4	P	616	0	0	0.6	-0.6	0.9
44606	34.8	-52.1	P	1140	0	38	0.8	0.5	1.0
44607	41.6	-44.0	P	580	0	31	1.0	-0.5	1.1
44608	39.8	-40.7	P	1116	0	38	1.0	0.9	1.3
44609	51.1	-38.0	P	1182	0	41	1.1	-0.5	1.2
44610	45.3	-50.1	P	1045	0	34	1.0	-0.7	1.2
44611	52.1	-46.4	P	697	1	2	1.2	0.0	1.2
44616	41.1	-20.7	P	695	0	0	0.8	-0.5	0.9
44624	39.1	-15.6	P	700	0	24	4.0	-2.0	4.5
44625	31.0	-19.4	P	724	0	0	0.5	-0.1	0.5
44627	38.0	-23.9	P	653	0	0	0.6	-0.6	0.9
44721	30.4	-46.5	P	720	0	0	0.5	0.1	0.5
44723	44.2	-21.9	P	686	0	1	1.1	0.3	1.2
44726	59.2	-37.9	P	1421	0	49	0.7	0.0	0.7
44730	61.5	-13.8	P	1467	0	51	0.6	0.1	0.6
44743	64.5	-31.1	P	420	4	67	3.2	-1.4	3.5
44763	42.4	-22.3	P	700	0	0	0.8	0.0	0.8
44764	54.3	-25.6	P	690	0	1	1.2	-0.1	1.2
44767	51.5	-34.1	P	629	0	1	1.2	0.2	1.2
44769	56.2	-36.0	P	689	0	1	1.0	-0.2	1.0
44770	53.1	-39.1	P	86	0	23	1.3	-0.7	1.5
44772	60.6	-31.2	P	651	0	1	1.1	-0.4	1.2
44773	45.6	-29.8	P	673	0	3	1.4	0.6	1.5
44775	34.7	-42.1	P	229	0	0	0.5	-0.3	0.6
44780	60.6	-22.7	P	600	0	40	0.6	0.0	0.6
47554	73.3	-76.6	P	352	0	58	0.7	-0.2	0.7
48527	73.4	-75.5	P	2	0	0	0.2	-0.3	0.4
62501	31.4	-36.9	P	697	0	0	0.6	0.2	0.7
62502	51.3	-21.1	P	625	0	1	0.8	-0.3	0.8
62503	29.6	-40.6	P	722	0	0	0.5	-0.4	0.7

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
62504	32.5	-16.4	P	145	0	0	0.5	-0.2	0.5
62505	53.2	-33.8	P	681	1	1	1.0	-0.1	1.0
62506	46.3	-12.9	P	148	0	38	0.4	-1.0	1.1
62507	50.4	-16.2	P	670	0	1	1.0	-0.4	1.1
62508	46.1	-15.7	P	689	0	1	1.1	-0.1	1.1
62509	55.4	-19.2	P	652	1	3	1.2	0.7	1.4
62512	41.2	-14.1	P	903	0	27	1.2	0.3	1.3
62513	37.3	-30.5	P	699	0	1	1.0	0.4	1.1
62514	35.0	-35.0	P	1243	0	46	0.8	0.0	0.8
62515	34.9	-25.7	P	712	0	0	0.5	0.0	0.5
62517	32.6	-27.2	P	698	0	0	0.6	-0.2	0.6
62519	43.0	-11.1	P	690	0	1	1.0	0.5	1.1
62696	56.4	-23.4	P	1255	0	45	1.0	-0.2	1.0
62711	62.8	-30.8	P	890	0	27	1.0	0.0	1.0
62712	57.7	-35.1	P	687	0	2	1.3	0.2	1.3
64553	61.7	-17.6	P	733	0	44	0.7	-0.4	0.8
65517	58.8	-45.8	P	230	1	2	1.5	0.1	1.5
WIND SPEED									
135600	35.8	-9.6	SPEED	1	0	100	0.0	-2.5	2.5
41503	21.4	-48.1	SPEED	598	0	100	1.2	-0.7	1.4
41522	17.7	-46.1	SPEED	597	0	100	1.4	0.3	1.5
41531	27.1	-73.5	SPEED	613	0	100	2.4	0.3	2.4
41532	23.4	-70.1	SPEED	622	0	100	2.0	0.0	2.0
41533	27.0	-76.0	SPEED	615	0	100	2.5	0.2	2.5
41534	23.4	-70.4	SPEED	620	0	100	2.0	0.0	2.0
41536	20.1	-68.4	SPEED	558	0	100	2.2	-0.1	2.2
41537	26.8	-71.4	SPEED	620	0	100	2.2	0.0	2.2
41559	30.3	-75.0	SPEED	51	2	100	2.0	0.3	2.0
41561	20.1	-67.2	SPEED	431	0	100	2.2	0.8	2.3
41563	20.6	-54.3	SPEED	519	0	100	2.2	1.6	2.7
41647	26.1	-68.4	SPEED	755	0	100	1.8	0.5	1.8
41648	24.9	-70.4	SPEED	607	0	100	1.8	0.5	1.8
41649	10.3	-51.3	SPEED	569	0	100	2.3	1.4	2.7
41652	29.1	-65.3	SPEED	597	10	100	5.4	5.0	7.3
41667	27.6	-75.7	SPEED	242	8	100	4.2	-1.3	4.4
44601	38.0	-41.4	SPEED	612	0	100	2.6	1.1	2.8
44602	42.6	-51.6	SPEED	598	0	100	3.2	0.2	3.3
62502	51.3	-21.1	SPEED	619	0	100	2.6	1.4	2.9
62711	62.8	-30.8	SPEED	889	0	100	2.2	1.2	2.5
WIND DIRECTION									
41503	21.4	-48.1	DIRN.	63	0	0	15.7	5.6	16.6
41522	17.7	-46.1	DIRN.	246	0	0	14.9	-3.2	15.2
41531	27.1	-73.5	DIRN.	161	1	0	24.5	11.1	26.9
41532	23.4	-70.1	DIRN.	179	2	0	17.5	27.4	32.5
41533	27.0	-76.0	DIRN.	204	0	0	30.2	9.7	31.7
41534	23.4	-70.4	DIRN.	204	0	0	14.9	29.2	32.8
41536	20.1	-68.4	DIRN.	217	0	0	17.9	32.0	36.6
41537	26.8	-71.4	DIRN.	151	0	0	20.1	-11.6	23.2
41559	30.3	-75.0	DIRN.	33	3	0	22.4	2.9	22.6
41561	20.1	-67.2	DIRN.	272	1	0	23.1	-18.5	29.6
41563	20.6	-54.3	DIRN.	159	1	0	14.5	-0.6	14.5
41647	26.1	-68.4	DIRN.	224	0	0	22.3	4.8	22.8
41648	24.9	-70.4	DIRN.	143	1	0	22.3	70.7	74.1
41649	10.3	-51.3	DIRN.	209	1	0	24.2	-10.0	26.2
41652	29.1	-65.3	DIRN.	299	20	0	32.1	-10.1	33.7
41667	27.6	-75.7	DIRN.	32	59	0	35.8	42.9	55.9
44601	38.0	-41.4	DIRN.	403	0	0	18.0	6.7	19.2
44602	42.6	-51.6	DIRN.	421	0	0	27.5	0.9	27.5
62502	51.3	-21.1	DIRN.	503	0	0	18.3	-9.1	20.4
62711	62.8	-30.8	DIRN.	773	0	0	19.2	0.8	19.2

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures:		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
AAL	1151	4	11	2.0	0.3	1010	0	6	0	7.1	0.8
ABD	21	0	10	1.8	0.4	20	0	10	0	10.4	-1.6
ACA	1430	0	2	1.5	-0.3	1365	0	2	0	5.9	0.3
AEA	181	0	3	1.6	0.4	52	0	8	0	10.1	-1.9
AEL	269	0	15	2.8	0.0	189	1	10	0	7.4	0.5
AFL	333	1	1	1.6	0.4	321	1	2	0	6.8	0.6
AFR	881	1	9	1.7	0.2	707	0	10	0	7.8	0.7
AIS	124	1	11	1.8	-1.1	112	0	13	0	8.2	0.2
AJM	292	0	5	1.7	-0.4	222	0	6	0	9.1	0.5
AMM	80	0	11	1.8	0.3	68	0	13	0	6.6	-0.9
AMX	222	2	9	2.3	0.3	143	0	4	0	8.9	0.3
AUA	28	0	0	1.4	0.4	25	0	0	0	4.0	1.3
AZA	417	4	17	2.8	0.7	359	1	9	0	8.7	0.0
BAL	125	1	14	1.7	0.2	102	0	16	0	10.4	-0.1
BAW	516	0	10	1.8	-0.7	499	0	11	0	7.6	0.2
BSK	24	13	13	1.4	0.5	24	0	8	0	7.5	1.4
BWA	83	0	5	1.9	0.0	47	0	4	0	5.9	1.5
CFC	28	0	7	1.8	0.4	27	0	7	0	5.7	1.1
CFG	382	0	5	1.8	-0.8	309	0	6	0	7.2	0.5
CGA	31	0	0	1.1	-0.3	27	0	0	0	4.6	1.3
CGF	21	0	0	1.1	-0.4	21	0	0	0	3.7	0.0
CGH	71	0	0	1.0	-0.1	68	0	0	0	3.6	0.8
CLX	237	0	2	1.7	-0.5	226	0	2	0	5.6	0.0
COA	148	0	22	1.9	0.2	91	0	26	0	9.3	0.1
CRL	130	1	5	1.8	0.3	101	0	7	0	11.5	-0.4
CUB	146	10	27	3.5	2.2	100	0	15	0	10.8	-1.6
DAB	126	0	3	1.1	-0.2	113	0	4	0	3.9	0.6
DAI	92	0	0	1.0	0.1	87	0	0	0	4.0	0.8
DAL	1153	1	17	1.7	-0.6	1000	0	16	0	7.5	0.4
DBR	42	2	7	1.8	-0.2	40	0	3	0	9.2	1.0
DCE	82	0	10	1.2	0.2	63	0	13	0	9.4	0.5
DHL	40	0	100	6.7	-6.6	38	3	29	0	11.9	2.8
DLH	977	0	11	1.5	-0.1	943	0	11	0	6.2	0.6
EDW	50	2	6	1.4	0.0	37	0	5	0	5.2	-0.4
EIA	136	16	29	3.1	1.7	132	0	100	0	19.5	6.9
ELY	162	1	4	1.7	0.0	154	0	3	0	7.2	1.3
ETH	25	0	12	1.2	0.3	23	0	22	0	9.5	-1.2
EWV	71	0	8	1.7	0.1	67	0	13	0	14.2	-0.3
FDX	769	0	35	1.6	0.1	759	0	36	0	7.0	0.7
FGS	112	0	2	1.4	0.5	105	0	1	0	4.5	1.6
FGZ	39	0	3	1.4	0.0	37	0	0	0	4.2	0.2
FIN	211	0	5	1.6	0.1	202	0	4	0	6.6	0.9
GAF	28	0	7	2.6	-1.5	28	0	0	0	5.7	-0.4
GCO	321	1	6	1.7	-0.3	312	0	46	0	8.2	0.8
GOJ	23	0	0	0.9	0.3	21	0	0	0	3.2	0.5
GRL	41	0	0	1.2	0.2	39	0	0	0	4.7	1.2
GTI	178	0	7	1.8	0.2	179	1	8	0	8.4	-0.3
GVR	40	0	0	0.9	-0.2	35	0	0	0	4.6	1.4
GWW	49	0	2	1.1	-0.5	44	0	2	0	3.0	0.1
IBE	1157	1	8	1.7	0.4	626	0	12	0	9.0	0.0
ICE	875	0	3	1.5	-0.3	828	0	4	0	6.2	0.6
IWD	83	2	6	1.7	0.0	23	0	4	0	6.3	-0.2
JMC	51	0	2	1.1	0.3	40	0	5	0	6.8	1.0
KLM	1067	0	3	1.7	0.1	910	0	4	0	6.9	0.5
LAN	27	4	15	1.3	0.0	28	7	25	0	14.1	-3.0
LDA	35	6	17	1.2	0.3	28	0	18	0	6.4	-1.2
LDI	293	4	15	3.0	0.6	208	1	3	0	8.1	-0.6
LIB	141	2	9	1.8	0.8	75	0	9	0	8.0	2.3
LOT	95	0	4	1.8	-1.4	91	0	7	0	5.6	0.8

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
LTU	542	0	7	2.0	0.0	431	0	6	0	7.0	0.7
MON	50	0	4	1.2	-0.1	37	0	5	0	6.2	1.2
MPD	204	2	5	2.0	0.8	83	1	4	0	6.9	0.3
MPH	401	0	3	1.9	-0.5	355	1	3	0	8.1	0.5
MYT	229	0	3	1.6	-0.1	204	0	3	0	8.3	0.3
NCA	35	0	0	1.6	0.3	31	0	0	0	4.5	1.4
NWA	3463	0	4	1.6	0.2	3431	0	4	0	6.9	0.4
PAC	355	2	5	1.6	0.3	349	1	5	0	7.1	0.5
RAM	192	2	5	1.7	0.1	116	0	6	0	11.0	0.5
RCH	219	2	100	2.5	0.7	170	1	100	0	10.1	1.6
RJA	37	0	14	3.0	-1.2	38	0	8	0	8.4	2.9
RRR	201	1	10	2.1	-0.6	184	0	10	0	6.9	1.2
RZO	86	0	2	1.5	-0.4	61	0	3	0	7.5	1.6
SLR	131	0	7	1.4	0.2	124	0	8	0	7.6	1.0
SVA	45	2	16	2.5	0.3	44	0	11	0	10.6	-0.3
TAP	242	1	7	1.7	-0.1	125	0	10	0	9.1	0.9
THT	27	0	7	2.1	0.6	28	0	4	0	5.5	0.8
TSC	194	1	3	1.4	0.0	173	1	6	0	8.1	1.9
UAL	428	0	71	1.9	-1.0	443	1	72	0	9.2	0.9
UPS	1170	1	46	1.8	0.1	1141	0	46	0	7.4	0.0
USA	151	0	0	1.4	0.0	105	0	2	0	9.2	0.3
VIR	192	0	3	1.4	-0.1	187	0	5	0	8.7	1.1
WOA	67	1	15	2.1	-0.2	65	2	18	0	9.8	2.8
9VS	67	0	1	1.3	0.0	64	0	2	0	4.6	1.1
EU	31714	0	24	1.2	0.1	31714	0	24	0	4.5	0.3
KL	428	3	43	2.8	0.4	426	1	45	0	17.2	1.4
LH	559	0	14	1.3	0.8	558	0	14	0	4.1	0.4
TN	22	0	9	2.3	1.9	22	0	9	0	4.5	0.7
N	1300	0	7	1.5	0.1	1245	0	7	0	5.4	0.7
US ACARS	48434	5	47	1.4	0.1	48434	0	43	0	5.2	0.4

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	9	0	20.2	20.2	0.2
DBBH	12	Z	100	18	0	16.6	30.2	25.2
DBLK	12	Z	100	7	0	9.9	23.2	21.0
ELML7	00	Z	100	14	0	19.1	26.2	17.9
ELML7	12	Z	100	16	0	20.9	37.8	31.5
FNOR	00	Z	100	5	0	10.2	16.0	-12.4
FNOR	12	Z	100	8	1	8.8	9.7	4.0
FNOU	00	Z	100	9	0	8.1	19.1	-17.3
FNOU	12	Z	100	6	0	27.6	28.8	8.0
FNPH	00	Z	100	13	0	27.7	32.7	-17.5
FNPH	12	Z	100	8	0	17.4	18.2	5.1
FNRS	00	Z	100	6	0	33.9	36.0	-12.2
FNRS	12	Z	100	4	0	13.1	13.3	-2.3
LDWR	00	Z	100	26	0	21.0	23.2	-9.8
LDWR	12	Z	100	25	0	16.2	17.5	-6.6
OXYH2	00	Z	100	7	0	8.9	11.8	-7.7
OXYH2	12	Z	100	7	0	11.1	11.6	-3.4
TOULOUS00		Z	100	31	0	11.0	30.3	28.2
TOULOUS12		Z	100	29	0	11.4	26.7	24.2
V2XO	00	Z	100	6	0	7.9	8.4	-2.8
V2XO	12	Z	100	6	0	15.0	18.2	10.3
WPKD	00	Z	100	4	0	9.6	9.6	-0.5
WPKD	12	Z	100	7	0	16.3	22.1	15.0
ZCBP6	00	Z	100	5	0	21.3	22.3	6.8
ZCBP6	12	Z	100	7	0	21.5	22.3	5.9
03953	00	Z	100	30	0	20.2	23.1	11.3
03953	12	Z	100	30	0	17.8	28.8	22.6
04018	00	Z	100	30	0	14.1	14.4	-2.7
04018	12	Z	100	30	0	16.4	21.2	13.4
04220	00	Z	100	26	0	14.0	21.2	-16.0
04220	12	Z	100	27	0	14.2	21.6	-16.3
04270	00	Z	100	26	0	12.2	14.2	-7.3
04270	12	Z	100	26	0	13.4	14.4	-5.3
04339	00	Z	100	26	0	16.6	21.0	-12.8
04339	12	Z	100	28	0	14.7	16.4	-7.1
04360	00	Z	100	25	0	15.5	19.1	-11.2
04360	12	Z	100	28	0	12.7	17.3	-11.9
08001	00	Z	100	25	0	24.9	26.9	-10.0
08001	12	Z	100	21	3	28.6	28.6	0.5
08508	00	Z	100	24	0	13.4	26.3	22.7
08508	12	Z	100	27	0	14.8	39.9	37.0
08522	00	Z	100	30	0	9.7	26.4	24.6
08522	12	Z	100	29	0	11.3	31.6	29.4
08594	12	Z	100	20	0	15.5	33.5	29.7
60020	00	Z	100	8	0	11.0	30.3	28.3
60020	12	Z	100	7	0	13.6	36.9	34.3
71600	00	Z	100	29	0	19.7	21.5	8.5
71600	12	Z	100	30	0	19.0	20.0	6.1
72201	00	Z	100	27	0	12.0	20.0	16.0
72201	12	Z	100	26	0	10.1	30.7	29.0
72402	00	Z	100	29	0	19.7	29.7	22.2
72402	12	Z	100	30	0	19.3	42.7	38.1
74494	00	Z	100	26	0	12.3	20.3	16.2
74494	12	Z	100	28	0	15.0	16.8	7.6
78016	00	Z	100	30	0	12.9	33.8	31.3
78016	12	Z	100	30	0	14.1	31.5	28.2

TABLE 11

**MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 2002**

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	10	0	10.2	11.5	-5.2
DBBH	12	Z	500	18	0	8.3	8.9	3.4
DBLK	12	Z	500	7	0	10.2	10.5	-2.6
ELML7	00	Z	500	14	0	15.2	15.3	-2.1
ELML7	12	Z	500	18	0	10.0	10.8	3.9
FNOR	00	Z	500	5	0	4.1	4.3	-1.4
FNOR	12	Z	500	9	0	7.0	8.0	3.9
FNOU	00	Z	500	10	0	7.7	8.7	-4.1
FNOU	12	Z	500	9	0	11.5	12.2	-4.0
FNPH	00	Z	500	15	0	11.0	12.5	-5.9
FNPH	12	Z	500	10	0	12.1	12.3	-2.4
FNRS	00	Z	500	8	0	23.9	26.3	-11.0
FNRS	12	Z	500	4	0	17.2	19.5	-9.3
LDWR	00	Z	500	26	0	18.0	18.4	4.1
LDWR	12	Z	500	25	0	12.9	13.8	-4.7
OXYH2	00	Z	500	7	0	11.7	14.8	9.0
OXYH2	12	Z	500	7	0	13.0	14.2	5.9
TOULOUS00		Z	500	31	0	4.8	7.1	5.2
TOULOUS12		Z	500	29	0	10.3	14.3	10.0
V2XO	00	Z	500	6	0	18.3	19.3	6.0
V2XO	12	Z	500	6	0	23.5	25.9	11.0
WPKD	00	Z	500	6	0	10.5	11.4	-4.5
WPKD	12	Z	500	7	0	10.2	11.4	5.1
ZCBP6	00	Z	500	6	0	4.5	5.5	3.2
ZCBP6	12	Z	500	7	0	12.7	13.4	4.3
03953	00	Z	500	30	0	16.7	16.7	-1.2
03953	12	Z	500	30	0	15.5	20.7	13.6
04018	00	Z	500	30	0	11.7	15.9	10.7
04018	12	Z	500	30	0	14.2	19.0	12.7
04220	00	Z	500	26	0	10.7	11.3	3.7
04220	12	Z	500	27	0	11.0	12.4	5.7
04270	00	Z	500	26	0	10.3	11.7	5.6
04270	12	Z	500	27	0	11.4	13.0	6.4
04339	00	Z	500	26	0	11.2	14.9	9.8
04339	12	Z	500	28	0	9.7	11.9	6.9
04360	00	Z	500	25	0	10.8	11.5	4.0
04360	12	Z	500	28	0	11.3	13.0	6.5
08001	00	Z	500	28	0	16.1	17.9	-7.9
08001	12	Z	500	23	3	17.7	18.2	-4.5
08508	00	Z	500	25	0	10.1	10.7	-3.6
08508	12	Z	500	27	0	23.8	23.8	0.9
08522	00	Z	500	30	0	6.5	6.7	1.7
08522	12	Z	500	30	0	9.3	11.0	5.8
08594	12	Z	500	21	0	7.9	8.8	3.7
60020	00	Z	500	8	0	7.5	8.0	2.9
60020	12	Z	500	7	0	5.8	8.0	5.6
71600	00	Z	500	30	0	11.5	11.8	-2.7
71600	12	Z	500	30	0	12.4	12.5	-1.5
72201	00	Z	500	27	0	7.2	7.3	1.3
72201	12	Z	500	28	0	5.6	7.5	5.0
72402	00	Z	500	30	0	12.6	12.8	-2.3
72402	12	Z	500	30	0	10.6	10.6	0.3
74494	00	Z	500	29	0	8.6	8.6	-0.4
74494	12	Z	500	29	0	9.3	9.4	-1.3
78016	00	Z	500	30	0	9.2	15.5	12.5
78016	12	Z	500	30	0	12.5	20.0	15.5

TABLE 12

**MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 2002**

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	8	0	0	3.6	1.4	0.0
DBBH	12	V	100	18	0	0	7.3	-0.8	1.3
DBLK	12	V	100	4	0	0	3.6	-2.1	-0.7
ELML7	00	V	100	11	0	0	4.6	-0.5	0.7
ELML7	12	V	100	13	0	0	5.8	-0.1	-0.7
FNOR	00	V	100	5	0	0	4.1	-0.9	1.5
FNOR	12	V	100	9	0	0	4.6	1.1	-1.9
FNOU	00	V	100	9	0	0	5.9	-1.7	-0.1
FNOU	12	V	100	6	0	0	4.7	-0.6	1.7
FNPH	00	V	100	12	0	0	4.6	0.8	1.6
FNPH	12	V	100	7	0	0	3.4	0.0	-0.2
FNRS	00	V	100	6	0	0	5.7	1.3	0.1
FNRS	12	V	100	4	0	0	4.5	1.5	1.9
LDWR	00	V	100	26	0	0	2.2	-0.3	0.3
LDWR	12	V	100	25	0	0	2.5	0.1	0.4
OXYH2	00	V	100	7	0	0	6.5	0.4	-2.6
OXYH2	12	V	100	6	0	0	1.8	-0.3	-0.7
TOULOUS00		V	100	30	0	0	5.1	1.7	-0.3
TOULOUS12		V	100	29	0	0	4.7	1.0	-0.6
V2XO	00	V	100	5	0	0	2.2	1.2	-0.5
V2XO	12	V	100	6	0	0	1.9	-0.5	-1.3
WPKD	00	V	100	2	0	0	1.5	0.7	0.6
WPKD	12	V	100	6	0	0	3.8	1.0	0.0
ZCBP6	00	V	100	4	0	0	4.1	-3.6	0.3
ZCBP6	12	V	100	6	0	0	3.5	-0.2	0.4
03953	00	V	100	30	0	0	3.7	1.4	-0.1
03953	12	V	100	30	0	0	3.3	0.6	0.2
04018	00	V	100	29	0	0	3.1	-0.1	0.1
04018	12	V	100	30	0	0	3.3	0.4	0.4
04220	00	V	100	26	0	0	2.4	0.2	0.2
04220	12	V	100	26	0	0	2.2	0.3	-0.2
04270	00	V	100	25	0	0	2.4	0.4	0.0
04270	12	V	100	26	0	0	3.4	1.4	0.4
04339	00	V	100	17	0	5	8.4	0.3	-1.3
04339	12	V	100	26	0	0	5.6	0.7	-0.2
04360	00	V	100	25	0	0	3.2	0.1	0.3
04360	12	V	100	28	0	0	2.6	0.7	0.7
08001	00	V	100	25	0	0	5.2	2.3	0.1
08001	12	V	100	20	0	0	3.3	0.3	-0.1
08508	00	V	100	16	0	0	3.6	-0.4	0.3
08508	12	V	100	17	0	0	4.3	0.8	1.6
08522	00	V	100	25	0	0	3.9	-0.5	0.7
08522	12	V	100	28	0	0	3.9	0.1	0.6
08594	12	V	100	21	0	100	6.0	-3.1	0.5
60020	00	V	100	8	0	0	4.1	-0.9	-0.4
60020	12	V	100	6	0	0	2.7	0.9	-1.2
71600	00	V	100	29	0	0	4.3	0.0	0.2
71600	12	V	100	30	0	0	3.7	0.9	0.0
72201	00	V	100	26	0	0	3.9	0.8	-1.0
72201	12	V	100	26	0	0	3.9	0.9	-0.8
72402	00	V	100	27	0	0	4.2	0.3	-0.5
72402	12	V	100	30	0	0	4.2	0.7	0.3
74494	00	V	100	26	0	50	5.0	-0.5	-0.2
74494	12	V	100	28	0	42	4.9	-1.0	-0.2
78016	00	V	100	29	0	0	4.8	0.5	-0.2
78016	12	V	100	30	0	0	5.4	-1.2	-1.3

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS		:Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	9	0	0	2.9	-0.1	0.7
DBBH	12	V	500	18	0	0	4.4	0.1	0.7
DBLK	12	V	500	7	0	0	2.6	-1.5	0.6
ELML7	00	V	500	11	0	0	5.8	-0.5	-0.7
ELML7	12	V	500	16	0	0	3.0	-0.5	0.9
FNOR	00	V	500	5	0	0	4.2	-1.6	1.6
FNOR	12	V	500	9	0	0	3.4	-1.4	0.7
FNOU	00	V	500	9	0	0	3.9	-1.2	0.3
FNOU	12	V	500	8	0	0	5.0	-1.1	-1.4
FNPB	00	V	500	16	0	0	3.7	-0.3	0.8
FNPB	12	V	500	10	0	0	3.4	-0.9	0.4
FNRS	00	V	500	8	0	0	5.1	-2.2	-0.8
FNRS	12	V	500	4	0	0	2.2	0.4	0.8
LDWR	00	V	500	26	0	0	3.2	0.2	-0.4
LDWR	12	V	500	25	0	0	2.7	-0.8	-0.6
OXYH2	00	V	500	6	0	0	3.7	-0.4	0.0
OXYH2	12	V	500	7	0	0	4.6	1.8	-0.1
TOULOUS00	V	500	31	0	0	4.1	0.6	-0.7	
TOULOUS12	V	500	29	0	0	4.1	0.5	-0.1	
V2XO	00	V	500	6	0	0	2.4	0.6	-0.7
V2XO	12	V	500	6	0	0	4.5	0.4	1.1
WPKD	00	V	500	3	0	0	2.2	0.2	0.7
WPKD	12	V	500	7	0	0	4.5	0.3	-0.6
ZCBP6	00	V	500	5	0	0	5.2	-1.9	-2.9
ZCBP6	12	V	500	6	0	0	3.3	1.2	-1.0
03953	00	V	500	30	0	0	5.0	-0.8	-1.1
03953	12	V	500	30	0	0	3.9	0.9	-0.2
04018	00	V	500	30	0	0	5.2	0.5	-0.9
04018	12	V	500	30	0	0	4.0	0.5	-0.5
04220	00	V	500	26	0	0	3.7	-0.8	0.7
04220	12	V	500	26	0	0	3.9	-0.7	0.0
04270	00	V	500	26	0	0	4.2	-0.2	0.8
04270	12	V	500	27	0	0	3.9	0.2	0.0
04339	00	V	500	20	0	0	4.7	-0.3	-1.2
04339	12	V	500	28	0	0	5.3	1.2	1.0
04360	00	V	500	25	0	4	5.9	-0.3	-0.3
04360	12	V	500	28	0	0	3.9	0.1	0.0
08001	00	V	500	28	0	0	5.8	0.7	1.3
08001	12	V	500	24	0	0	4.6	-0.4	-0.5
08508	00	V	500	17	0	0	3.8	-0.7	0.2
08508	12	V	500	17	0	0	6.5	-0.2	-0.2
08522	00	V	500	30	0	0	3.4	-0.3	-0.1
08522	12	V	500	30	0	0	4.4	-0.1	0.2
08594	12	V	500	22	0	100	4.2	-0.7	-1.5
60020	00	V	500	7	0	0	2.9	0.0	-0.2
60020	12	V	500	5	0	0	4.6	-0.7	-1.2
71600	00	V	500	30	0	0	3.2	0.3	0.6
71600	12	V	500	30	0	0	3.6	0.7	-0.1
72201	00	V	500	27	0	0	2.5	-0.1	0.2
72201	12	V	500	28	0	0	2.9	-0.1	0.0
72402	00	V	500	29	0	0	3.3	0.6	-0.1
72402	12	V	500	30	0	0	3.4	1.1	-0.7
74494	00	V	500	29	0	48	4.9	-1.0	-0.7
74494	12	V	500	28	0	42	3.2	-0.4	0.1
78016	00	V	500	30	0	0	4.6	0.2	-0.4
78016	12	V	500	30	0	0	4.3	-0.2	-1.0

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45